

CHEMICAL ENGINEERING

ALAN B. MORRIS
Publisher

NICHOLAS P. CHOPEY
Editor-in-Chief

In 1902, the McGraw Publishing Co. for the first time founded its own magazine, a monthly called *Electrochemical Industry*. This was renamed *Electrochemical and Metallurgical Industry* in 1905 and, a year later, it absorbed the magazine *Iron & Steel*. In 1910, the name was changed to *Metallurgical and Chemical Engineering*, and in 1918 this name was changed again to *Chemical and Metallurgical Engineering*. In 1946, the current name—*Chemical Engineering*—was adopted, and in 1958 the publication began appearing every two weeks. Thus the magazine has a continuous history lasting more than eighty years. In 1917, the McGraw-Hill Publishing Co. was formed, incorporating the magazine operations of the McGraw Publishing Co. and the Hill Publishing Co. Ours was the first magazine to be formed by either company.

McGRAW-HILL INC., NEW YORK CITY

VOLUME 92

January to December 1985
GENERAL ALPHABETICAL INDEX

A					
Absorbents—DOE discovers high-capacity SO ₂ absorbent, pressure-hydrated lime (N).....	Apr 15	38			
Absorption					
Absorber/stripper design with a programmable calculator, Lloyd R. Hile (diagram, tables, flowchart).....	Apr 29	53			
Cryogenics: Principles and applications, Helmut Springmann (tables, graphs, flowsheets, diagrams).....	May 13	*58			
Distributors: Boosting tower performance by more than a trickle, Richard Zanetti & others (N) (graph).....	May 27	*22			
Accounting—Joint-product costing—CE Cost File, Kenneth E. Lunde (tables) Part 2: Application.....	Jan 7	95			
Acetic Anhydride—Tennessee Eastman: Acetic anhydride from coal—Kirkpatrick Award Winner (flowcharts).....	Dec 9	*79			
Achema 85—A facelift for Achema 85, Herb Short (N).....	May 13	*27			
Adsorption					
Design for pilot system that will reduce the volume of resins used to adsorb radioactive material from nuclear-powerplant wastewater (C).....	Oct 28	11			
Separating hydrogen from CO, hydrocarbons and other contaminants using PSA route: Bergbau process (C).....	Aug 19	9			
UC details new adsorption process (C).....	Apr 15	17			
Africa—Chemical engineering: A changing profession—report (charts).....	Jan 7	*22			
International outlook: Africa and Middle East.....	Jan 7	31			
Agitation					
Agitation intensity: Key to scaling up flow-sensitive liquid systems, Richard L. Bowen, Jr. (graphs, tables).....	Mar 18	159			
Extend the life of slurry agitators, S. Raghavachari (P.N.) (diagrams).....	Apr 1	98			
Agricultural Byproducts—Easier degradation of cellulose in agricultural byproducts with USDA process (C).....	Dec 9	9			
Agricultural Chemicals—PPG Industries steps up biotech research: agreement with Scripps (N).....	Feb 18	39			
Air Pollution					
Acid rain					
Acid-rain cleanup on DOE agenda (N).....	Mar 4	31			
Acid rain is annually causing an estimated \$5 billion in damage in 17 states says study (C).....	Aug 5	12			
U.S.-Canadian three-year deadlock over acid rain crumbles (C).....	Apr 1	12			
CE alert: New technology					
57th inventory.....	Mar 4	81			
58th inventory.....	Aug 19	64			
Clean Air Act					
Du Pont wins approval to test-market methanol fuel blends for autos (C).....	Feb 4	10			
Ethanol producers are elated at news of Du Pont waiver (C).....	Feb 4	11			
EPA takes action on three chemicals (N).....	Nov 11	40			
DOE seeking to scale up process for cleaning up both SO ₂ and NO _x (C).....	Apr 29	10			
UOP, Inc. will scale up DOE process (C).....	Nov 11	18			
"Electrogenation" offers a possible solution to air pollutants (C).....	June 10	11			
EPA's E-SO ₂ method points to less costly approach for SO ₂ removal from stack gases (C).....	Aug 19	9			
EPA's inspection of stationary sources of air pollution is inadequate says GAO report (C).....	Dec 9	12			
EPA proposes a limited strategy for dealing with hazardous air emissions (C).....	June 24	12			
EPA's air toxics policy arouses opposition, Maria Recio & Reginald Rhein (N).....	July 8	*29			
EPA standards for industrial boilers: Will new sulfur-emission regulations expand the fluidized-bed combustor market? (C).....	July 8	19			
EPA's "tall stacks" rules cause furor (C).....	July 22	12			
Membranes will be investigated in a process to recover organic solvents from waste gas streams (C).....	Aug 5	11			
Mobile system from Switzerland achieves air-pollution measurements at distances up to 3km (C).....	Sept 16	12			
Particulate tests: Do you need a fourth particulate-sampling test? Gerald A. Rich (diagram, table).....	Aug 5	117			
Portable device that determines the nature and quantity of toxic vapors (C).....	Oct 14	10			
Sulfur removal see Desulfurization ; Sulfur					
U.S. air-purification market will top \$1.1 billion/yr by 1989 (C).....	Aug 19	11			
Waxman-Wirth bill, H.R. 2576 ("Bhopal bill") criticized by EPA (C).....	June 24	12			
West Germany: ammonia-based catalytic process removes NO _x from stack gas (C).....	Oct 28	12			
West Germany: Fluegas treatment for combined SO ₂ , NO _x acids and particulates removal will be tested at Arzberg facility (N).....	June 24	9			
Alcohol					
Alcohol wood-pulping process: Katzen to design a 25-30-ton/d plant (C).....	Sept 30	9			
Ethanol see Ethanol					
Methanol see Methanol					

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

Aldicarb see **Safety**—UC's Institute, W.Va. plant

Algae—Japan: Harima's process uses algae to make unsaturated wax from tall fatty acid (C) Sept 30

Alloys

Database for new metal alloys being jointly developed by ASM and NBS (N) Apr 15

Lower-cost, high-temperature alloys for boilers and gas turbines (C) Oct 14

Selecting alloys for chloride service. Gary N. Kirby (charts & tables) Part 1: Feb 4

*81, Part 2: Mar 4

Using tests and service histories to select metals and alloys. William L. Silence & others (charts, tables) Apr 29

Aluminum

Pacific Northwest electric rates: Relief in sight for aluminum? (N) Aug 19

Tungsten could replace aluminum in semiconductor manufacture (C) Mar 18

American Assn. of Engineering Societies

AAES narrows its scope, gives up unifying role. Nicholas Basta & Wilma Price (N) May 27

Relocating to Washington, D.C. (C) Jan 21

American Institute of Chemical Engineers

Biotechnology and the Chemical Engineer, study (C) Oct 28

"Center for Chemical Plant Safety" planned (C) Apr 15

Center for Chemical Plant Safety gets work underway. Paula Dwyer (N) June 10

New agenda for AIChE safety center (N) Nov 25

Women's issues discussed at meeting (N) Sept 30

Ammonia

BP-Kellogg ammonia process could trim energy and production costs (C) Oct 14

ICI has improved version of its AMV ammonia process (C) Nov 11

West Germany: ammonia-based catalytic process removes NO_x from stack gas (C) Oct 28

Analysts—Sizing up particle analyzers. Cynthia Fabian Mascone (N) Nov 11

Argentina—Petrochemical complex at Bahia Blanca will be completed (C) Aug 19

Asbestos—EPA may regulate asbestos after all (C) Apr 1

Asia—Chemical engineering: A changing profession—report (charts) Jan 7

International outlook: Asia Jan 7

Atomic Power—China: Nuclear knowhow a plus (N) Feb 18

Audits—Managing your environmental audit. David L. Russell (tables) June 24

—Letters Sept 16

Automation

Process automation—CE Refresher (diagrams, tables) (R)

11. Microprocessor controllers. Noal F. McGee Feb 4

12. Sequential control. Ernest M. Cohen & Willi Fehervari Apr 29

13. Fault-tolerant processes. Ernest M. Cohen Sept 16

14. Optimizing process and economic aims. James A. Rogers Dec 9

Robots: ICEF warns workers of killer robots (N) Apr 29

Automobiles

Ceramics: cars loom big in ceramics future—world market study (N) Sept 2

Du Pont announces amorphous nylon for auto applications—"Bexloy" (C) Feb 4

Awards

1985 Kirkpatrick Chemical Engineering Achievement Award

Help us to honor engineering excellence (N) Feb 4

CE Kirkpatrick contest down to five finalists (N) Aug 5

1985 Kirkpatrick Chemical Engineering Achievement Award Dec 9

Winners

Tennessee Eastman Co.: Acetic anhydride from coal (flow charts) Dec 9

Honorable Mentions

Exxon Research & Engineering Co.: H₂S cleanup Dec 9

Texaco Inc.: Synthesis gas Dec 9

Himont Inc.: Polypropylene Dec 9

Union Carbide: Purer silicon Dec 9

B

Bacteria

Bacteria that consume toxic chemicals will be cultured in polluted soil (C) Oct 14

Bugs eat their way through PCBs (N) Feb 4

Enhanced oil recovery: Research brightens future of enhanced oil recovery. Gerald Parkinson (N) (diagrams, chart) Mar 4

Foam-block blanket cozy for bacteria: G-P's blanket of polystyrene blocks for winter-time efficiency of biological-treatment ponds (N) Sept 16

Metals recovery makes big splash in Canada: two conferences, CIM Metallurgical Soc. and 6th International Symposium on Bioremediation. Gerald Parkinson (diagram) (N) Sept 30

Microbial process for removing PCP from soil (C) Sept 30

Volatile halogenated hydrocarbons are produced by marine organisms report MIT researchers (C) Mar 18

Batch Operations—Modify your batch reactor's material-transfer system to avoid problems. James D. King & Kevin M. Egan (P.N.) (diagram) May 27

Batteries—Sodium/sulfur battery system will be developed cooperatively by Sandia and Chloride Silent Power Ltd. (C) Oct 28

Bearings—Expansion and nonexpansion: More learning—the hard way. X.P. Riance (chart, diagram) May 13

Fixed and expansion shaft-bearings: More learning the hard way—Part 2. X.P. Riance (diagrams) June 10

—Letter Aug 5

Beneficiation—TVA developing one-step phosphate-ore beneficiation process (C) Apr 15

Biomass

Converting crushed fruit pulp to biogas with Cornell's anaerobic fermenter (C) Oct 14

France: INRA researchers develop better way of making and utilizing the enzyme ligninase (C) Aug 19

France to pilot test fluidized-bed process for gasifying biomass (C) Nov 11

Biopolymers—EOR projects may benefit from Elf Aquitaine's new biopolymer, scleroglucan (C) June 10

Biotechnology

AIChE study, *Biotechnology and the Chemical Engineer* (C) Oct 28

Bioprocesses that could compete with established methods: Chem Systems study (C) Oct 28

Biotechnology: Fermentation and downstream processing—report. Ed Bjurstrom (charts, tables, diagrams) (R) Feb 18

—Letter June 24

Biotechnology testing

Field testing of gene-spliced "ice minus" organisms still being held up (C) Feb 18

Both sides disputing field tests of gene-spliced bacteria claim victory (C) Mar 18

CE alert: New technology

57th inventory Mar 4

58th inventory Aug 19

Chemical engineering schools—Biotechnology caution—letter May 13

—Letter June 24

Drug house buys biotechnology firm: Eli Lilly to purchase Hybritech (N) Oct 14

Europeans trim biotech budget (N) Jan 21

Great Britain: Biotech method will be used to decontaminate a major toxic waste site in Blackburn (C) Nov 25

MIT and Alfa-Laval to set up joint center to research biochemical separations (C) Sept 16

Monsanto intends to buy G.D. Searle: will finance biotech expansion with oil and gas assets (C) Aug 5

Monsanto-Searle: A biotech coupling (N) Aug 19

A new biotech concern: exports to hostile nations. Rex Rhein (N) Sept 2

New impetus for hi-tech research: six U.S.-government supported centers. Rex Rhein (N) Aug 5

PPG Industries steps up biotech research: agreement with Scripps (N) Feb 18

Patent protection starts at biotech conference: Industrial Biotechnology Assn. Jeff Trewhitt (N) June 24

U.N.-sponsored biotechnology center sets a schedule for staffing (C) Mar 18

U.S. biotech industry will require at least 5,000 bioprocess engineers: CRC study (C) Oct 28

U.S. Midwest makes pitch for biotech-research firms. Jeff Trewhitt (N) Apr 15

Washington decides on biotechnology regulation. Rex Rhein (N) Feb 18

Washington sets up new group to oversee biotech work. Rex Rhein (N) Nov 11

Bleaching—Sulfur- and chlorine-free pumping/bleaching process proposed by Canadian inventor, Steven Kooi (C) Jan 21

Blood—Aquaunatics' innovative membrane will be studied for blood purification (C) May 13

Boilers

EPA standards for industrial boilers: Will new sulfur-emission regulations expand the fluidized-bed combustor market? (C) July 8

Estimate boiler-blowoff steam flow. V. Ganapathy (P.N.) (chart) July 22

GRI's test data on new burner for firetube boilers, Pyrocore burner (C) Aug 19

—Postscripts, corrections Sept 30

Operating boilers intermittently. Charles A. Faust (graph, diagram, table) July 8

Temperature compensator for controlling the air/fuel ratio to boilers (C) Nov 25

Book Reviews

Aerosols: An industrial and environmental science. George M. Hidy Mar 18

Basic practice of chemical engineering. 2nd ed. Esber I. Shaheen May 13

Catalyst poisoning. L. Louis Hegedus & Robert W. McCabe June 24

Chemical engineering thermodynamics. Thomas E. Daubert Aug 19

Chemical reactor design and operation. K.R. Westerterp, W.P.M. van Swaaij & A.A.C.M. Beenackers Mar 18

Chemistry and technology of explosives. Tadeusz Urbanski Sept 2

The design and application of process analyzer systems. Paul E. Mix Aug 19

Electrode processes and electrochemical engineering. Fumio Hine Nov 25

Energy conservation in the process industries. W.F. Kenney Apr 15

Engineering flow and heat exchange. Octave Levenspiel July 22

Fluid flow pocket handbook. Nicholas P. Cheremisinoff July 8

Fundamentals of heat transfer for process engineering. David Azbel Apr 29

Glass engineering handbook. 3rd ed. George W. McLelland & E.B. Shand Aug 5

Handbook of corrosion resistant piping. 2nd ed. P.A. Schweitzer May 13

Handbook of engineering economics. Max Kurtz Apr 1

Handbook of powder science and technology. Ed. M.E. Fayed & L. Otten Jan 7

Handbook of synfuels technology. Ed. Robert A. Meyers Mar 18

Hazardous and toxic materials: Safe handling and disposal. Howard H. Fawcett Mar 4

Heat pumps in industry. F. Moser & H. Schmitzer Sept 30	102	Compressible flow in pipes: calculator program. Ilona Györi (diagram, tables) Oct 28	55	SRM: Helping to detect catalyst poisons (N) Feb 18	45
Heat transfer applications in process engineering. David Azbel Apr 29	93	Programs for predicting properties with the TI-59 calculator. James H. Weber (tables) Feb 4	63	Sulfonic acid catalyst: for use in Polysar plant to make isomylene by catalytic distillation (C) Aug 19	10
Heat transfer fluids and systems for process and energy applications. Jasbir Singh Sept 2	103	Part 16: Predict surface tensions of pure liquids Feb 4	87	Treating hydrogen sulfide: An alternative to Claus-LO-CAT process uses catalytic reagent. L.C. Hardison (flowchart, graph) Jan 21	62
Heat transfer pocket handbook. Nicholas P. Cheremisinoff July 8	124	Part 17: Predict surface tensions of binary liquid mixtures Oct 14	125	UOP catalyst could trim the cost of making styrene by 1¢/lb (C) Nov 25	14
Heterogeneous reactions: Analysis, examples, and reactor design. L.K. Doraiswamy & M.M. Sharma Apr 15	115	Regression equations forced through a coordinate point. Leonard A. Jonas & others (charts, tables) May 27	5	U.S., European refiners ready for low-lead limits. Raúl Remírez & others (charts) (N) Oct 14	18
Hydrocyclones. L. Svarovsky June 10	111	—Postscripts, corrections July 8	17	West Germany: ammonia-based catalytic process removes NO _x from stack gas (C) Oct 28	12
Hydrodynamics of gas-solids fluidization. Nicholas P. Cheremisinoff & Paul N. Cheremisinoff Feb 18	197	Canada	19	Zeolite catalyst for fluidized-catalytic cracking from Katalistiks (C) June 10	9
Kirk-Othmer concise encyclopedia of chemical technology. Ed. Martin Grayson Sept 16	109	Alberta Research Council announces r-DNA results using yeasts (C) May 27	31	Cavitation—Preventing cavitation in butterfly valves. Hans D. Baumann (graphs, diagrams) Mar 18	149
McGraw-Hill concise encyclopedia of science and technology. Ed. Sybil P. Parker May 27	161	CANMET and McGill Univ. developing process to co-extract radium and uranium from ore (C) Sept 2	5	Cellulose—USDA process offers easier degradation of cellulose in agricultural byproducts (C) Dec 9	9
Metals handbook—desk edition. Ed. Howard E. Boyer & Timothy L. Gall May 27	161	Chemetics announces project for recovering spent sulfuric acid from TiO ₂ production by the sulfate route (C) Nov 25	11	Central America—Chemical engineering: A changing profession—report (charts) Jan 7	*22
Modeling, analysis and control of dynamic systems. William J. Palm III Apr 1	103	CPI seek to rebound from recession. Philip M. Kohn & others (N) Jan 21	19	International outlook: Central America Jan 7	33
Perry's chemical engineers' handbook, 6th ed. Late Ed. Robert H. Perry; Ed. Don W. Green Jan 21	141	—Postscripts, corrections Apr 15	42	Centrifuges—Disc-bowl centrifuges. James West (diagram, table) Jan 7	*69
Phase equilibria in chemical engineering. Stanley M. Walas Aug 5	123	DeVoe-Holbein Canada's novel technique for the removal of heavy metals from water (C) Dec 9	*19	Ceramics	
Pneumatic conveying. 2nd ed. H.A. Stoeck, Jr. Feb 4	95	Metals recovery makes big splash in Canada: two conferences, CIM Metallurgical Soc. and 6th International Symposium on Biodynametallurgy. Gerald Parkinson (diagram) (N) Sept 30	31	Cars loom big in ceramics future—world market study (N) Sept 2	35
Pneumatic and hydraulic conveying of solids. O.A. Williams Feb 4	95	New ways to recover hard-to-reach petroleum. Gerald Parkinson (N) (flow diagram) Apr 15	18	Ebonex, a new conductive ceramic, is making its U.S. debut (C) Mar 18	17
Pocket handbook for solid-liquid separation. Nicholas P. Cheremisinoff July 8	124	Polysar plant to make high-purity isomylene by catalytic distillation (C) Aug 19	19	New ceramic units seek high-temp applications. Frank J. Tanzosh (N) Feb 18	*30
Practical machinery management for process plants. Vol. 2: Machinery failure analysis and troubleshooting. Heinz P. Block Feb 18	198	Prices: Canadians establish new energy pricing (N) Apr 29	42	Sintered alpha-silicon carbide: An advanced material for CPI applications. Robert W. Lashway (graph, tables) Dec 9	121
Process instruments and controls handbook, 3rd ed. Ed. Douglas M. Considine Oct 14	127	Sulfur and chlorine-free pulping/bleaching process proposed by inventor. Kooi (C) Jan 21	5	Strong demand for ceramics foreseen by Charles H. Kline & Co. (N) June 24	19
Process modifications for industrial pollution source reduction. Lawrence L. Tavarlarides Oct 28	77	Wabush Mines studying construction of manganese extraction plant (N) Feb 18	19	U.S. Advanced Ceramics Assn. will hold first board meeting (C) Sept 16	12
Recovery, recycle and reuse of industrial waste. Kenneth E. Noll, Charles N. Haas, Carol Schmidt & Prasad Kodukula Oct 28	77	Ways to recover heavy oil, bitumen, star at UN conference: HRI process; CANMET facility; DRB process. Gerald Parkinson (N) Sept 16	42	Chem Show 1985	
Separation of particles from air and gases. Akira Ogawa June 10	112	Carbide	5	Chem Show 1985—report Nov 11	*93
Understanding how components fail. Donald J. Wulpi Nov 25	78	Pfaudler unveiling silicon-carbide tubing for heat exchangers (C) Feb 18	17	Equipment & services preview Nov 11	*96
4th ed. Warren L. McCabe, Julian C. Smith & Peter Harriott July 8	123	Sintered alpha-silicon carbide: An advanced material for CPI applications. Robert W. Lashway (graph, tables) Dec 9	17	Exhibit highlights Nov 11	*105
Water. Supply use treatment (a rundown of new books) Nov 11	239	Carbon Dioxide—CO ₂ recovery takes a new twist: GAS/SPEC process (N) Sept 30	11	List of exhibitors Nov 11	131
What went wrong. Trevor A. Kleitz Dec 9	137	Carbon Monoxide—British Gas' plan to scale up CO-to-methane process at Scottish plant set back by explosion (C) Apr 1	9	"Chemical Engineering"	
The Wiley engineer's desk reference: A concise guide for the professional engineer. Sanford I. Heisler Apr 29	94	Carbon Oxide—Separating hydrogen from CO, hydrocarbons and other contaminants using PSA route: Berghau process (C) Aug 19	9	Help us to help you (Ed) May 27	5
Brazil—First biofertilizer plant to use a continuous process, developed by IPT, may be built (C) Dec 9	11	Careers	5	The new face of chemical engineering (Ed) Jan 7	5
Eurners—GRI's test data on new burner for firetube boilers, Pyrocore burner (C) Aug 19	9	Chemical engineering: A changing profession—report (charts) Jan 7	23	CE Cost File	
—Postscripts, corrections Sept 30	5	Portrait of the new Ch.E. Jan 7	26	CE cost indexes set slower pace. Jay Matley (chart, tables) Apr 29	75
		Job forecast for the 1990's Jan 7	30	Cogeneration fuels—the high cost of lower heating values. Paul L. Bancel (diagram) Nov 11	215
		International outlook Jan 7	32	Estimating engineering cost. Otto Mendel (tables) Dec 9	117
		Engineering career is focus of study by NRC (N) July 8	5	Heat exchangers: Costs of double-pipe and multitube heat exchangers. G.P. Purohit (flowchart, graphs, tables) Part 1: Mar 4-93, Part 2: Apr 1	85
		The new face of chemical engineering (Ed) Jan 7	23	Joint-product costing. Kenneth E. Lunde (tables) Part 2: Application Jan 7	95
		Catalysts	26	Minimizing fan energy costs. Robert C. Monroe (charts, diagram) Part 1: May 27-141, Part 2: June 24	57
		Catalysis demands for fine chemicals (N) Oct 28	30	Pipe loop or expansion joint? Robert K. Broyles (diagrams, tables) Oct 14	103
		Ethylene/propylene copolymerization benefits from new titanium catalysts (C) July 22	32	Transfer pricing. Kenneth E. Lunde (tables) Feb 4	*85
		Hard task: Choosing a route for making polypropylene. Herb Short & Wilma Price (N) (flow charts) July 8	5	—Postscripts, corrections Nov 11	5
		Higher yields through better catalysts July 8	24	Updated cost factors. Ivan V. Klumpar & Steven T. Slavsky (graphs, tables) July 22	73
		Modest gains seen for catalysts (N) Mar 18	10	Part 1: Process equipment July 22	76
		New catalysts hold keys to new chemical reactions. Jay Chowdhury (N) Oct 28	22	Part 2: Commodity materials Aug 19	85
			25	Part 3: Installation labor Sept 16	85
			33	CE Refresher	
			19	Process automation (diagrams, tables) (R) Feb 4	67
				11. Microprocessor controllers. Noal F. McGee Feb 4	61
				12. Sequential control. Ernest M. Cohen & Willi Fehervari Apr 29	73
				13. Fault-tolerant processes. Ernest M. Cohen Sept 16	95
				14. Optimizing process and economic aims. James A. Rogers Dec 9	

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

CE Tutorial

- Statistics, Robert E. Miller (diagrams, graphs, tables) (R) Jan 21
 4. Means and variances Sept 30
 5. Analysis of variance Mar 18
 6. Time-series analysis June 19
 —Postscripts Sept 30
 7. Correlation and regression Sept 30

Chemical Industry

- Allied-Signal Inc. begins major reorganization plan (C) Dec 9
 Atlantic Richfield will be scaling back and restructuring its operations (C) May 13
 BASF will enter the engineering services business (C) July 8
 Dow Chemical starting cost-cutting program (C) Dec 9
 Mergers & acquisitions
 Air Products buying Getty Synthetic Fuels Co. (C) Sept 2
 Allied Corp. will buy Signal Cos. (C) Sept 2
 Allied shareholders approve acquisition (C) Sept 30
 Chevron divests Gulf Canada oil business in deal with Olympia & York Developments Ltd. (C) June 10
 Dow buys FilmTec, maker of thin-film membranes (N) July 22
 Hercules sells its explosives business to Irec Chemicals (C) Mar 4
 Lilly, Eli to purchase Hybritech: drug house buys biotechnology firm (N) Oct 14
 Monsanto intends to buy G.D. Searle: will finance biotech expansion with oil and gas assets (C) Aug 5
 Monsanto-Searle: A biotech coupling (N) Aug 19
 Owens-Corning purchases Armo's Aerospace and Strategic Materials Group (C) Sept 2
 Trafalgar House purchases 29.9% stake in John Brown PLC (C) July 22
 Union merger: United Paperworkers International and OCAW appear set to merge in 1986 (C) Mar 4
 United Technologies selling Inmont Div. to BASF (C) May 27
 Monsanto's reorganization plan (C) Nov 11
 Union Carbide engineers speak out. Nicholas Basta (N) Dec 9
 Chemical Warfare—House-Senate conference lifts 16-year ban on the making of chemical weapons (C) Aug 5

China

- Advanced-technology "QSL" lead smelter to be built (C) Mar 18
 China and the chemical engineer. Thomas Garcia-Borras July 22
 Nuclear knowhow a plus (N) Feb 18
 Chlor-Alkali—Coupling electrolytic cells to alkaline fuel cells could achieve energy savings at chlorine-caustic plants (C) Sept 16
 Chlorine—Desulfurization process uses chlorine to oxidize sulfur from coal (C) Oct 14
 Chloroform—EP takes action on three chemicals (N) Nov 11
 Chromatography—Biotechnology: Fermentation and downstream processing—report. Ed Bjurstrom (charts, tables, diagrams) (R) Feb 18
 —Letter June 24
 Chrom—SKF Steel breaks ground on its first Plasmachrome plant (C) Mar 18
 CIM Metallurgical Soc.—Conference: Metals recovery makes big splash in Canada. Gerald Parkinson (diagram) (N) Sept 30
 Clay—Michigan researchers' route to detoxify dioxin using clay (C) Sept 2

Cleaning

- Cleaning pipelines: A pigging primer. Peter Kipin (diagrams) Feb 4
 Petroform method of cleaning oil storage tanks uses "robot" spraying system (C) Jan 7

Clothing—New wardrobe for CPI workers. Cynthia Fabian Mascone (N) Aug 19

Coal

- Coal-water-mixture projects: SFC cuts back plans for funding (C) Feb 4
 Cogeneration see **Generators**
 DOE announces cheaper cleanup for coal gas (N) Mar 18
 DOE collects bids for coal-cleaning technology, but doesn't want to fund expanded R&D in the area (C) May 27
 DOE's MHD program achieves milestone with successful startup of coal-fired test unit at Butte, Mont. (C) Oct 14
 DOE will select seven laboratories to study new "indirect" methods for converting coal to liquids (C) Sept 30
 EPRI-sponsored project in North Carolina field tests for removing mineral pollutants from coal ash (C) Jan 7
 FBC being started by Kellogg at Houston labs (C) Apr 15
 Fluidized-bed: DOE seeks to develop advanced coal-combustion technology (C) July 22
 Gasification see **Gasification**
 Heating value of coal can be upgraded by 10% in a pyrolysis process (C) Sept 30
 Liquefaction see **Liquefaction**
 Los Alamos looks at cobalt recovery from coal wastes (C) Feb 4
 Slagging combustor burns coal efficiently. Nicholas Basta (diagram) Sept 30
 Slurries: U.S.S.R. with Occidental Petroleum help to build coal-slurry pipeline (C) Jan 7
 Substitute natural gas made from coal at a cost of \$5.08/million Btu in Rockwell's AFHP process (C) Nov 25
 UOP will study the coking of coal and residual oil under a DOE grant (C) Jan 21

Coatings—Sandia's new method of coating with thin glass films (N) Mar 4

Cobalt

- Argonne's two-step route for refining Co and Mn from low and medium-grade ores (C) Apr 29
 U.S. BOM pilots a process to recover cobalt from coppermine byproduct streams; Los Alamos looks at cobalt recovery from coal wastes (C) Feb 4

Columns

- Calculating minimum reflux. Victor E. Arnold (diagram, graphs, table) Feb 4
 Complex binary distillation: graphically find theoretical trays and minimum reflux. Henry Z. Kister (diagrams) Jan 21
 —Postscripts, corrections Mar 4
 Complex multicomponent distillation: Graphically find theoretical trays and minimum reflux. Henry Z. Kister (diagrams, graphs, tables) May 13
 Distributors: Boosting tower performance by more than a trickle. Richard Zanetti & others (N) May 27
 The ideal-column concept: Applying exergy to distillation. Victor Kaiser & Jean-Paul Gourla (tables, diagrams, graphs) Aug 19
 Packing: Structured is the byword in tower-packing world. Richard Zanetti & others (N) Mar 4

Combustion

- DOE seeks to develop advanced coal-combustion technology (C) July 22
 Measuring particles from combustion (N) June 24
 Slagging combustor burns coal efficiently. Nicholas Basta (diagrams) Sept 30
 Temperature compensator for controlling the air/fuel ratio to boilers (C) Nov 25

Communication

- How to present a paper at a conference. V. Ganapathy (chart, table) Sept 30
 Language: Watch your language overseas. Roger E. Axtell May 27
 —Letter Sept 30
 Telephone: Make the telephone work for you. Joseph W. Mocarski Sept 2

Composites

- Du Pont sets up new composites division (N) Nov 11
 Polymer composites: Growth forecast (N) Feb 18

Compressors

- Compressor uses up to 17% less power than units of other designs July 8
 Determine possible compressor icing conditions. Steven R. Johnson (graph) (P.N.) Feb 4
 Operating performance of reciprocating or positive-displacement compressors. Michael Polonyi (P.N.) (chart) Dec 9
 Protect turbomachinery from magnetism. Ashok K. Mittal (P.N.) (diagrams) June 24

Computers

- CAD: Microcomputer CAD systems. Victor E. Wright (diagrams) July 8
 CAD: Process-design system, Advent, offers capital, operating savings May 13
 CAD: Transferring CAD flowsheets. William G. Beazley (diagrams) Part I: Oct 28 *61 Part 2: Dec 9 113
 CAD/CAM: U.S. CAD/CAM equipment market will grow to \$15 billion in 1989 (C) Apr 1 10
 Computer hardware finding niches in CPI engineering-design work. Nicholas Basta (N) (charts) Apr 29 *14
 Database for new metal alloys being jointly developed by ASM and NBS (N) Apr 15 37
 Databases announced for industrial wastes and plastics (C) May 27 17
 Distributed computer systems for the plant. J. Ara Barsamian (diagram) Feb 18 *179
 Du Pont and Phillips form partnership to produce optical disks (C) Nov 11 19
 Flare system design by microcomputer. Tom Chungth Tsai (table, diagram) Aug 19 55
 —Letter Oct 28 5
 Hewlett-Packard unveils new personal computer for engineers, the "Integral" PC (C) Jan 21 17
 ICI computer network provides online data on plant profitability (C) Sept 16 11
 IChemE offering a computer module on physical-property data (C) June 10 11
 Integrated computer-aided engineering. Richard A. Peters (charts) May 13 95
 —Postscripts, corrections July 8 5
 Making profitability a process-control variable: ICI's CoAudition system. Nicholas Basta & Herbert C. Short Nov 11 *86
 Microcomputer process control. William L. Schreiber (graphs, table, diagrams) Aug 5 109
 Microprocessor-based distributed control systems. G.J. Cordova & others (table, diagrams) Jan 21 *86
 —Postscripts, corrections (cover) Mar 4 5
 Modeling chemical reactors. Robert W. Wansbrough (tables, graphs) Aug 5 95
 PCs: by 1990 about 3 out of every 4 engineers will be using a PC on the job (C) Aug 5 10
 Photogrammetry and computer-aided piping design. John F. Kenefick & Richard D. Chirillo (diagrams) Feb 18 173
 Process automation—CE Refresher see **Automation**
 Programming control algorithms. Darrell O'Kelly & Mark Mullins (charts) Mar 18 183
 Selecting a personal computer. Steve Morrison (table) Sept 30 79
 Software
 Battelle's software package, ISTUM-PC, does energy forecasting (N) May 13 31
 Computerized maintenance management offers dividends for CPI firms. Nicholas Basta (N) June 10 *14
 Converting software for microcomputers. Ian Sutton Jan 21 *115
 Expert systems. Vaughan Voller & Brian Knight (diagrams) June 10 93
 Expert systems gear up for process synthesis job. Jay Chowdhury (N) (diagram) Aug 19 17

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

Fluid-flow and flow-network software—review. Mark A. Lipowicz (diagrams)..... Nov 25	59	13. Fault-tolerant processes. Ernest M. Cohen..... Sept 16	73	UOP catalyst could trim cost of making styrene by 1¢/lb (C)..... Nov 25	14
Personal-computer-software reviews. Mark Lipowicz..... Sept 2	*85	14. Optimizing process and economic aims. James A. Rogers..... Dec 9	95	Counseling—Effective coaching and counseling. Paul B. Thornton & Paul J. LeVarge..... Mar 18	191
Process I: A friendly but powerful simulator for distillations of near-ideal mixtures..... Sept 2	*85	Process controllers don "expert" guises. Jay Chowdhury & others (N)..... June 24	*14	Creativity—How to unclone your organization. Fredericka Mackenzie & Martin Haydon (diagram)..... June 10	*99
Process Engineering Software Package: A computerized design notebook..... Sept 2	*86	Radio transmission replaces cables for process controls in data system developed by PACS (C)..... Dec 9	10	Critical path see Scheduling	
Process controllers don "expert" guises. Jay Chowdhury & others (N)..... June 24	*14	Timing a cooling tower. Jerry D. Warner (tables, graph) Part 1: Sept 30 '95, Part 2:..... Oct 28	*71	Cryogenics—Cryogenics: Principles and applications. Helmut Springmann (tables, graphs, flowsheets, diagrams)..... May 13	*58
Spreadsheets for chemical engineers. Design calculations. Stewart M. Goldfarb (diagrams)..... Apr 15	91	—Postscripts, corrections..... Nov 11	5		
Solving differential equations by the relaxation method. Robert Hirschel (diagrams)..... Apr 15	93	Transmitters: Two-wire or four wire? Frank J. Lawson (diagrams)..... Apr 1	73		
UC offers process-optimization service (C)..... Apr 15	17	Upgrading process instruments and control systems (diagrams, graphs)..... Nov 11	*171		
Upgrading process instruments and control systems (diagrams, graphs)..... Nov 11	*171	Retrofitting control system. John A. Moore..... Nov 11	172		
Putting computers in control. Albert A. Gunkler..... Nov 11	*177	Putting computers in control. Albert A. Gunkler..... Nov 11	177		
Concrete—Sulfur concrete for acid resistance. Scott S. Pickard (tables)..... July 22	*77	Conveyors—Screw conveyors: More learning—the hard way. X.P. Riance Part 2..... June 10	105		
	47	—Letter..... Aug 5	5		
Construction		Cooling—Specifying and operating desuperheaters. George E. Bowie (table, chart, diagrams)..... May 27	119		
CE construction alert Apr 15-77..... Nov 25	47	—Postscripts, corrections..... July 22	5		
Constructing with corrosion-resistant lead. Willem Brandsema (charts, table)..... Oct 14	*111	Cooling Towers			
Expansion joints for chemically resistant masonry. Walter L. Sheppard, Jr. (diagram)..... Aug 19	79	Minimizing fan energy costs—CE Cost File. Robert C. Monroe (diagrams, charts) Part 1: May 27-141, Part 2:..... June 24	57	Decision Making —What do you know about participative management? R.D. Gilbert (charts)..... Apr 1	79
—Postscripts, corrections..... Nov 25	5	Timing a cooling tower. Jerry D. Warner (tables, graph) Part 1: Sept 30 '95, Part 2:..... Oct 28	*71	Deciding—Determine possible compressor icing conditions. Steven R. Johnson (P.N.) (graphs)..... Feb 4	89
Forestalling construction problems. Vijay K. Pathak & Inder S. Rattan (diagrams)..... Nov 25	69	—Postscripts, corrections..... Dec 11	5	Denmark—Riso's process based on thiourea could replace cyanide recovery method for gold (N)..... Apr 1	25
Great Britain: Trafalgar House purchases 29.9% stake in John Brown PLC (C)..... July 22	11	Copolymerization—Ethylene/propylene copolymerization benefits from new titanium catalysts (C)..... July 22	10	Deposition—Direct deposition of metal circuits on semiconductors may be possible from the vapor phase says IBM (C)..... Feb 18	19
Prefabricated control modules. Richard C. von Brecht (diagrams)..... May 13	*85	Copper			
—Letter..... Aug 5	5	Kenecott and Outokumpu sign development and marketing agreement for improved copper-conversion process (C)..... Jan 7	17	Design	
Swedwards scaling back business in barge-mounted chemical plants (C)..... Jan 21	17	Minerco flotation agent cuts copper-processing costs (C)..... June 10	11	Absorber/stripper design with a programmable calculator. Lloyd R. Hile (diagram, tables, flowchart)..... Apr 29	53
Consultants—Tips for success in consulting. Navin D. Shah..... June 24	*53	U.S. BOM pilots a process to recover cobalt from coppermine byproduct streams (C)..... Feb 4	11	Biotechnology: Fermentation and downstream processing—report. Ed Bjurstrom (charts, tables, diagrams) (R)..... Feb 18	*126
				—Letter..... June 24	5
Controls				Bulk solids handling—report. Edwin V. Reece (charts, tables, diagrams)..... Apr 29	38
Avoid erratic control operation by suppressing relay arcs. James McAlister (P.N.) (nomograph, diagram)..... Mar 4	105			—Letters July 22-5..... Sept 2	5
Computers see Computers				Calculating minimum reflux. Victor E. Arnold (diagrams, graphs, table)..... Feb 4	59
Controller, Tricon 1, aims for critical applications..... Apr 1	*39			Calculator programs see Calculator Programs	
Controlling fired heaters. Vincent G. Gomes (diagrams, tables, flow charts)..... Jan 7	*63			Chemical plant safety: the longer, deeper view (Ed)..... Apr 1	5
Digital logic controller boasts speed, accuracy and flexibility..... Nov 25	*29			Chemical reactor data. S.M. Walas (tables)..... Oct 14	79
Does your plant instrumentation work properly? Donald L. May (charts, table, diagrams)..... Mar 4	67			Complex binary distillation: graphically find theoretical trays and minimum reflux. Henry Z. Kister (diagrams)..... Jan 21	*97
Gas-flow controller's large sensor area reduces clogging..... June 10	*37			—Postscripts, corrections..... Mar 4	5
Honeywell expands process-control technology and offers new products (C)..... Mar 4	17			Complex multicomponent distillation: Graphically find theoretical trays and minimum reflux. Henry Z. Kister (diagrams, graphs, tables)..... May 13	*71
ICI computer network provides online data on plant profitability (C)..... Sept 16	11			Computer-aided-design see Computers	
Making profitability a process-control variable: ICI's CoAudition system. Nicholas Basta & Herbert C. Short..... Nov 11	*86			Computer hardware finding niches in CPI engineering—design work. Nicholas Basta (N) (charts)..... Apr 29	*14
Microcomputer process control. William L. Schweber (graphs, table, diagrams)..... Aug 5	109			Eliminating potential process hazards—report. Trevor A. Kletz (diagrams, tables, flowchart) (R)..... Apr 1	48
Microprocessor-based distributed control systems. G.J. Cordova & others (table, diagrams)..... Jan 21	*86			—Letters June 10-5..... Dec 9	5
—Postscripts, corrections (cover)..... Mar 4	5			Emergency-relief systems are undersized: new lab instrument, called VSP, to conduct tests during simulated process upsets (C)..... Feb 18	18
Prefabricated control modules. Richard C. von Brecht (diagrams)..... May 13	*85			Estimating relief loads for thermally blocked-in liquids. Ernesto C. Valdes & Kenneth J. Svoboda (charts, tables)..... Sept 2	77
—Letter..... Aug 5	5			—Correction..... Sept 30	5
Process automation—CE Refresher (diagrams, tables) (R)				Expert systems gear up for process synthesis jobs. Jay Chowdhury (N) (diagram)..... Aug 19	17
11. Microprocessor controllers. Noel F. McGee..... Feb 4	67			Graphical techniques for process engineering. John E. Johnson & D. John Morgan (diagram, graphs, tables)..... July 8	72
12. Sequential control. Ernest M. Cohen & Willi Fehervari..... Apr 29	61			Hazard identification, analysis and control. Henry Ozog (tables, graph, diagrams)..... Feb 18	161
				Heat regenerators: Quick design and evaluation. Milorad P. Dudukovic & P.A. Ramachandran (diagrams, graphs)..... June 10	63
				—Postscripts, corrections..... Nov 11	5
				Maximizing energy savings for heat engines in process plants. Eric Hindmarsh and	

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

- others (tables, diagrams, flowsheets, graphs) Feb 4
Microprocessor-based distributed control systems. G.J. Cordova & others (table, diagrams) Jan 21
—Postscripts, corrections (cover) Mar 4
Modeling chemical reactors. Robert W. Wansbrough (tables, graphs) Aug 5
Orifice-meter design for steam flow. K.V. Kasipati Rao (P.N.) (nomograph) Aug 19
Photogrammetry and computer-aided piping design. John F. Kenefick & Richard D. Chirillo (diagrams) Feb 18
Predict saturation temperature as a function of vapor pressure. Mangesh P. Wagle (tables) June 10
Prefabricated control modules. Richard C. von Brecht (diagrams) May 13
—Letter Aug 5
Process-design system. Advent, offers capital operating savings May 13
Pumps: Downtime prompts upgrading of centrifugal pumps. Heinz P. Bloch & Donald A. Johnson (graphs, diagrams) Nov 25
Pumps: Selecting positive-displacement pumps—report. Donald J. Cody & others (charts, tables, diagrams) (R) July 22
—Postscripts, corrections Sept 2
—Letters Oct 28
Shortcut methods for determining optimum line sizing in SI units. Norbert J. Bell (chart, nomograph, table) (P.N.) Oct 14
Steam-system design: How it evolves—report. John F. Peterson & William L. Mann (charts, diagrams, tables) (R) Oct 14
Steam traps: New trap designs trim steam losses. Richard Zanetti & Shota Ushio (N) Sept 30
Troughs: Designing the optimum trough. Serban Constantinescu (P.N.) (chart) Dec 9
UC offers process-optimization service (C) Apr 15
Valves: Selecting pressure relief valves. Gary B. Emerson (diagrams) Mar 18
Valves: Specifying rotary valves. Edward D. Pittman (diagrams) July 8
Design See also **Plant Design**
Desiccants—Heaterless dryers are not heatless. Edwin M. Peacock, Jr. (diagrams, graphs, tables) Nov 11
Desulfurization
Chevron USA will invest \$400 million in oil and gas processing facilities at Gaviota, Calif. (C) Jan 7
Desulfurization process uses chlorine to oxidize sulfur from coal (C) Oct 14
Dorr-Oliver-Flakt process to convert dry-FGD wastes into usable products (C) Apr 1
EPA's E-SO_x method points to less costly approach for SO_x removal from stack gases (C) Aug 19
Metals recovery makes big splash in Canada: coal desulfurization. Gerald Parkinson (diagram) (N) Sept 30
Treating hydrogen sulfide: An alternative to Claus—LO-CAT process. L.C. Hardison (flowchart, graph) Jan 21
Diethyl Sulfate—UC fined \$3.9 million for alleged violations of TSCA rules involving diethyl sulfate tests (C) Mar 18
Dimethyl Sulfide—Pennwalt will be first U.S. commercial producer of DMDS (N) Apr 29
Distillation
Calculating minimum reflux. Victor E. Arnold (diagram, graphs, table) Feb 4
Canada: Polysar plant to make high-purity isomylene by catalytic distillation (C) Aug 19
Complex binary distillation: graphically find theoretical trays and minimum reflux. Henry Z. Kister (diagrams) Jan 21
—Postscripts, corrections Mar 4
Complex multicomponent distillation: Graphically find theoretical trays and minimum reflux. Henry Z. Kister (diagrams, graphs, tables) May 13
Distributors: Boosting tower performance by more than a trickle. Richard Zanetti & others (N) (graph) May 27
Horizontal distillation that can operate in a gravity-free environment (C) Sept 30
The ideal-column concept: Applying exergy to distillation. Victor Kaiser & Jean-Paul Gourlia (tables, diagrams, graphs) Aug 19
Packing: Structured is the byword in tower-packing world. Richard Zanetti & others (N) Mar 4
Predict saturation temperature as a function of vapor pressure. Mangesh P. Wagle (tables) June 10
Texas A&I's Serth develops continuous distillation route to produce essential oils (C) Sept 16
Distributors—Boosting tower performance by more than a trickle. Richard Zanetti & others (N) (graph) May 27
DNA
Canada's Alberta Research Council announces r-DNA results using yeasts (C) May 27
Guidelines for large-scale r-DNA fermentations. Chandra Sekhar (table, flow-diagram) Apr 29
Phillips Petroleum announces new gene-splicing mechanism for yeasts (C) May 27
Drugs
Lilly, Eli to purchase Hybritech: drug house buys biotechnology firm (N) Oct 14
Squibb's captopril: FDA's curb is lifted (C) July 22
Drugs—Fluidized-drum process for granulating fertilizers (C) Nov 25
Dryers & Drying—Heaterless dryers are not heatless. Edwin M. Peacock, Jr. (diagrams, graphs, tables) Nov 11
E
Economics
Canadian CPI seek to rebound from recession. Philip M. Kohn & others (N) Jan 21
—Postscripts, corrections Apr 15
Capital spending: CPI capital spending plans remain generous in 1985. Rauli Ramirez (N) (table) June 10
Capital spending: Slight decline is seen for a still-strong 10.4% (C) May 13
Capital spending: Slight decline is seen for CPI capital spending (N) (table) Dec 9
Capital spending: U.S. CPI capital spending will increase by about 0.7% to \$42.4 billion, in 1986 (C) Nov 11
DOE announces next round of small-business innovation grants (C) Jan 21
Dow Chemical starting cost-cutting program (C) Dec 9
Federal budget: House votes to rescind SFC's budget, except for \$1 billion that would be given to DOE (C) Aug 19
Federal budget: Some good news, and some bad news, is in the federal budget for 1986 (C) Feb 18
French industry ministry bailing out Technip (C) July 22
Investment Recovery Assn. has a permanent home (C) Mar 18
Libraries: How library spending stacks up. Wilma Price & others (N) Feb 4
Project evaluation: A review of recent developments. Terence E. Powell (charts, tables) Nov 11
R&D outlays to rise: Battelle forecast (N) Feb 18
Editorials
Chemical plant safety: the longer, deeper view Apr 1
Help us to help you May 27
The new face of chemical engineering Jan 7
Education
As for technicians Letter Nov 25
Chemical engineering: A changing profession—report (charts) Jan 7
Portrait of the new Ch.E. Jan 7
Fuel forecast for the 1990's Jan 7
Chemical engineering schools: What they're doing to adapt. Pia Farrell & others (charts, tables) (N) Apr 15
—Letters May 13-5 (June 24-5), June 10
College of Chemical Sciences: A modest proposal Letter Apr 19
—Letters Oct 14
Engineering career is focus of study by NRC (N) July 8
Georgia Institute of Technology sets up academic program to study zeolites and molecular sieves (N) May 27
It's rollercoaster time for Ch.E. supply/demand. Nicholas Basta (N) Sept 16
—Letter Nov 25
NRC report sees no "crisis" in engineering, but room for improvement of existing educational and institutional structures (C) May 27
U.S. B.S.Ch.E. graduates rose only 2.5% in 1984 (C) Feb 18
Electricity
Battelle revives the obsolete electric arc process for making fertilizers (C) Apr 29
California's Imperial Valley to get two geothermal-electricity plants (C) May 27
Cogeneration: see **Generators**
Fuel cells see **Fuel Cells**
Geothermal see **Geothermal**
Pacific Northwest rates: Relief in sight for aluminum? (N) Aug 19
Transmitters: Two-wire or four-wire? Frank J. Lawson (diagrams) Apr 1
Transparent plastic, "electrochromic" material PITN, is also a good conductor of electricity (C) Dec 9
Electrochemistry
Membrane-cell developments ease electrochemistry scaleup. Herbert C. Short & Robert Skole (diagrams) Mar 4
SRI process obtains methane via electrochemistry using carbonated water (C) July 8
Electrodes—Membrane-cell developments ease electrochemistry scaleup. Herbert C. Short & Robert Skole (diagrams) Mar 4
Electrolytic—Electrolytic cell produces high-purity hydrogen and oxygen from water (C) June 24
Electromagnetics—Detecting pollution in groundwater with electromagnetic system (N) Aug 5
Electronic Chemicals—Chemical demand in electronics (N) Nov 11
Electronics
Avoid erratic control operation by suppressing relay arcs. James McAlister (P.N.) (nomograph, diagram) Mar 4
Microelectronics—a challenge to chemical engineers. Graydon B. Larrabee (tables, graphs, diagrams) June 10
—Letter Sept 30
Electrostatic Precipitators—EPA's E-SO_x method points to a less costly approach for SO_x removal from stack gases (C) Aug 19
Employment
Chemical engineering: A changing profession—report (charts) Jan 7
Job forecast for the 1990's Jan 7
Du Pont's early retirement plan's popularity surprises company (C) Apr 29
Engineers: salaries are up for new U.S. Ch.E.s but recruiting is off (C) Aug 5
HTRI on its way up again: Good news for job-seeking engineers and scientists (C) Apr 1
It's rollercoaster time for Ch.E. supply/demand. Nicholas Basta (N) Sept 16
—Letter Nov 25
Job market
Engineers' job demand appears to be firm this spring (C) May 13
Job market for engineers and scientists

NOTES—*Illustrated; (C) Cementator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

appears to be slumping—HTRI survey (C).....	Jan 21	19	the critical path method. Roy J. Lyford-Pike.....	May 13	*103	Pollution control: CE alert—new technology.....	
Job offers for new engineering graduates with advanced degrees expected to increase by 7% in 1986 (C).....	Nov 25		Do-it-yourself technical Russian. Carlos Torres-Marchal (tables).....	Feb 4	49	57th inventory.....	Mar 4 81
Layoffs: Du Pont and Hoffmann-La Roche set major employee reductions (C).....	Feb 18	14	Education see Education			58th inventory.....	Aug 19 64
Energy			Effective coaching and counseling. Paul B. Thornton & Paul J. LeVarge.....	Mar 18	191	Environment: See also Air Pollution; Noise Control; Waste Disposal; Water Pollution	
Battelle's software package, ISTUM-PC, does energy forecasting (N).....	May 13	31	Employment see Employment			Enzymes	
Biomass see Biomass			Engineering career is focus of study by NRC (N).....	July 8	32	Biotech develops first enzyme immunoassay kit for detecting aflatoxin (C).....	Apr 29 9
Canadians establish new energy pricing (N).....	Apr 29	18	The golden rules of business politics. Harriet A. Katz & Eugenie L. Martin.....	Dec 9	*105	Common fungus produces enzymes capable of degrading PCBs (C).....	July 8 18
CE alert: New technology.....			How to get things done. Fred Pryor.....	July 8	*107	France: INRA researchers develop better way of making and utilizing the enzyme ligninase (C).....	Aug 19 10
57th inventory.....	Mar 4	76	How to organize a business trip. Kenneth J. McNaughton.....	Oct 14	*95	ICI scaling up enzyme process for treating cyanide-bearing wastes (C).....	Apr 15 18
58th inventory.....	Aug 19	60	How to overcome resistance to new ideas. George A. Pogany.....	Jan 7	*83	Lignin-degrading enzymes: more than ten identified in the "white rot" fungus (C).....	Sept 2 18
CE construction alert: Alternative energy Apr 15-85.....	Nov 25	54	How to present a paper at a conference. V. Ganapathy (chart, table).....	Sept 30	87	UCSF team redesigns enzyme, trypsin, to alter both its function and efficiency (C).....	Apr 29 9
Coupling electrolytic cells to alkaline fuel cells could achieve energy savings at chlorine-caustic plants (C).....	Sept 16	10	How to promote your invention to a patent committee. Anthony P. Venturino.....	Aug 5	*113	U.S. market for enzymes will reach \$300 million by 1989—Kline report (C).....	Mar 27 19
Dedert system may cut by 50% energy needed for solvent recovery from vapors (C).....	Apr 15	19	How to unclone your organization. Fredericka Mackenzie & Martin Haydon (diagram).....	June 10	*99	Equilibrium	
DOE announces next round of small-business innovation grants (C).....	Jan 21	17	International business protocol. Sondra Snowdon.....	Nov 25	65	Calculating minimum reflux. Victor E. Arnold (diagram, graphs, table).....	Feb 4 59
DOE energy programs in FY-86: bill that includes \$3.4 billion passed by the House and Senate (C).....	Oct 28	12	Make the telephone work for you. Joseph W. Mocarski.....	Sept 2	91	Estimate equilibrium for exponential change. William L. Klotz (P.N.) (graphs).....	Mar 4 108
DOE's new chief will be John Herrington, replacing Hodel (C).....	Jan 21	20	Managing your environmental audit. David L. Russell (tables).....	June 24	37	Equipment	
EIA's "Short-Term Energy Outlook": Petroleum demand will be stable in the U.S. this year (C).....	Mar 4	20	—Letters.....	Sept 16	5	Achema: A facelift for Achema 85. Herb Short (N).....	May 13 *27
European energy demand rose in 1984 despite higher prices (C).....	Jan 21	18	Microelectronics—a challenge to chemical engineers. Graydon B. Larrabee (tables, graphs, diagrams).....	June 10	*51	Dual-polymer laminates for corrosion-resistant equipment. J. Albert Rolston (tables).....	Jan 7 *89
The ideal-column concept: Applying exergy to distillation. Victor Kaiser & Jean-Paul Goutilla (tables, diagrams, graphs).....	Aug 19	45	—Letter.....	Sept 30	5	Engineering resins aim at wider CPI markets. Cynthia Fabian Mascone (N).....	Oct 14 *27
Maximizing energy savings for heat engines in process plants. Eric Hindmarsh & others (tables, diagrams, flowsheets, graphs).....	Feb 4	*38	The new face of chemical engineering (Ed).....	Jan 7	5	Equipment selection: How to really assess costs. Harold W. Russell (table).....	Aug 5 103
Minimizing fan energy costs—CE Cost File. Robert C. Monroe (charts, diagram) Part 1: May 27-141, Part 2:.....	June 24	57	Participative management: What do you know about participative management? R.D. Gilbert (charts).....	Apr 1	79	Petro Expo' 85: Preview—New products and services.....	Mar 18 *53
U.S. energy production hits a record high, and energy consumption is up—EIA report (C).....	May 27	18	Reading: How good are your reading skills? Barbara Marrs.....	Feb 18	*185	Preventing corrosion during mothballing. Ronald J. Twigg.....	Sept 16 *91
Energy See also Fuel , specific fuel			Salaries are Salaries			Ethanol	
Engineering			Stress: Are you a victim of hidden stress? Jerome Wilensky.....	Mar 4	*87	Boom in fuel ethanol begets new capacity and research. Richard Zanetti & others (N) (table).....	Jan 21 *38
BASF will enter the engineering services business (C).....	July 8	18	Traveling: Are you ready for that overseas trip? Thomas Garcia-Borras (table).....	Jan 21	*123	—Letter.....	Mar 4 5
A challenge to chemical engineers—microelectronics. Graydon B. Larrabee (tables, graphs, diagrams).....	June 10	*51	—Letter.....	Apr 29	5	—Postscripts, corrections.....	Apr 15 5
Estimating engineering cost—CE Cost File. Otto Mendel (tables).....	Dec 9	117	Union Carbide engineers speak out. Nicholas Basta (N).....	Dec 9	*21	Du Pont wins waiver to test-market methanol fuel blends for autos: ethanol producers elated (C).....	Feb 4 11
Integrated computer-aided engineering. Richard A. Peters (charts).....	May 13	95	Use personal public relations to build your career. Donald M. Levin.....	Sept 16	81	Processes for converting natural gas to fuel-grade ethanol from Davy McKee and Humphreys & Glasgow (C).....	Apr 15 18
—Postscripts, corrections.....	July 8	5	Watch your language overseas. Roger E. Axtell.....	May 27	*135	Ethylbenzene—Styrene from ethylbenzene, single-step isothermal process: New styrene process pares production costs. Herbert C. Short & Lois Bolton (flow chart).....	Aug 19 30
Engineers			—Letter.....	Sept 30	*135	Ethylene	
AAES narrows its scope, gives up unifying role. Nicholas Basta & Wilma Price (N).....	May 27	*27	What are your views on hazardous wastes? Nicholas Basta & others (survey, including questionnaire).....	Mar 4	*58	Ample petrochem feeds, says SRI study (N) (table).....	Nov 25 22
AIChE discusses women's issues (N).....	Sept 30	26	Engineers' opinion: Hazardous are not under "acceptable" control in the CPI (C).....	Sept 2	17	Ethylene/propylene copolymerization benefits from new titanium catalysts (C).....	July 22 10
Bioprocess engineers: U.S. biotech industry will require at least 5,000 bioprocess engineers: CRC study (C).....	Oct 28	11	Hazardous-waste management—report. Nicholas Basta, Roy V. Hughson & Cynthia F. Mascone (charts, tables).....	Sept 16	*58	Ethylene Oxide	
Biotechnology and the Chemical Engineer. AIChE study (C).....	Oct 28	11	What style of management do you prefer? W.H. Weiss.....	Feb 4	*77	EPA takes action on three chemicals (N).....	Nov 11 40
Chemical engineering: A changing profession—report (charts).....	Jan 7	*22	When job dissatisfaction strikes. James E. McAlister.....	Apr 29	69	OSHA decides not to set short-term exposure limits (C).....	Jan 7 20
Portrait of the new Ch.E.....	Jan 7	23	Engines—Maximizing energy savings for heat engines in process plants. Eric Hindmarsh & others (tables, diagrams, flowsheets, graphs).....	Feb 4	*38	Europe	
Job forecast for the 1990's.....	Jan 7	26	Audits: Managing your environmental audit. David L. Russell (tables).....	June 24	37	Biotechnology budgets trimmed (N).....	Jan 21 50
International outlook.....	Jan 7	30	—Letters.....	Sept 16	5	Chemical engineering: A changing profession—report (charts).....	Jan 7 *22
Chemical engineers are going online. Nicholas Basta (N).....	Oct 28	*16	California study confirms an increase in health problems in Santa Clara County (C).....	Feb 4	10	International outlook: Europe.....	Jan 7 30
China and the chemical engineer. Thomas Garcia-Borras.....	July 22	*65	Congressional agenda has much to affect CPI. Paula Dwyer (N).....	Apr 1	26	Energy demand rose in 1984 despite higher prices (C).....	Jan 21 18
College of Chemical Sciences: A modest proposal.....	Aug 19	5	Legislation: Environmental laws lead the list of CPI-related legislation to be considered by Congress (C).....	Jan 21	19	ICEF warns workers of killer robots (N).....	Apr 29 20
Computers: By 1990 about 3 out of every 4 engineers will be using a PC on the job (C).....	Aug 5	10				U.S., European refiners ready for low-lead limits. Raúl Ramirez & others (charts) (N).....	Oct 14 18
Consulting: Tips for success in consulting. Navin D. Shah.....	June 24	*53				Evaporation—Louisiana pulpmill installs single evaporator train (N).....	Aug 19 *23
Critical path method: Plan your time with						Explosions	
						Akron, Ohio "Recycle Energy Plant" explosion (C).....	Jan 7 18

NOTES—*Illustrated; (C) Chemticator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

- British Gas' plan to scale up CO-to-methane process at Scottish plant set back by explosion (C) Apr 1
Exports—Biotechnology: A new biotech concern—exports to hostile nations. Rex Rhein (N) Sept 2
Extraction
Argonne's two-step route for refining Co and Mn from low and medium-grade ores (C) Apr 29
Battelle launching novel research program on separation technologies (C) Oct 28
Canada: Wabash Mines studying construction of manganese extraction plant (N) Feb 18
CANMET and McGill Univ. developing process to co-extract radium and uranium from ore (C) Sept 2
CO₂ recovery takes a new twist: GAS/SPEC process (N) Sept 30
Critical-fluid extraction removes organics from hazardous wastes (diagram) June 24
Denmark's Riso process based on thiourea could replace cyanide recovery method for gold (N) Apr 1
Krupp unveils waste-oil recycling process (C) June 24
New ways to recover hard-to-reach petroleum. Gerald Parkinson (N) (flow diagram) Apr 15
Solvent-extraction U₂ enrichment can compete with gaseous diffusion (C) Sept 16
Supercritical fluids: still seeking acceptance. Nicholas Basta & Silke McQueen (N) Feb 4
- F**
Fans—Minimizing fan energy costs—CE Cost File. Robert C. Monroe (charts, diagram) Part I: May 27-141. Part 2: June 24
Fatty Acid—Japan: Harima's process uses algae to make unsaturated wax from tall fatty acid (C) Sept 30
Fermentation
Biotechnology: Fermentation and downstream processing—report. Ed Bjurström (charts, tables, diagrams) (R) Feb 18
—Letter June 24
Boom in fuel ethanol begets new capacity and research. Richard Zanetti & others (N) (table) Jan 21
—Postscripts, corrections Mar 4
Converting crushed fruit pulp to biogas with Cornell's anaerobic fermenter (C) Oct 14
Guidelines for large-scale r-DNA fermentations. Chandra Sekhar (table, flow-diagram) Apr 29
Fertilizers
Battelle revives the obsolete electric arc process for making fertilizers (C) Apr 29
Brazil's first biofertilizer plant to use a continuous process, developed by IPT, may be built (C) Dec 9
Fluidized-drum process for granulating fertilizers (C) Nov 25
Future fertilizer plants: What will they be like?—Fertilizer 85 conference. Herb Short (N) (tables) Apr 1
Fertilizers See also specific fertilizer
Fiber Optics
Industrial temperature sensing done with fiber optics Feb 4
Measure composition in situ via fiber-optic spectrophotometry Dec 9
New instrumentation will use antibodies. Jenness Keene & Herbert Lass (N) Apr 29
Fibers
Allied enters the high-strength market with new fiber, Spectra-900 (C) Mar 4
British Technology Group licenses high-modulus fiber technology to Celanese (C) Oct 14
CE alert: New technology
57th inventory Mar 4
58th inventory Aug 19
CE construction alert Apr 15-82, Nov 25
Ohio U. process can make fibers having different core and skin combinations in a single strand (C) Nov 25
Refractory fiber, spray-applied, cuts installation downtime (table) Aug 5
Filing—How to store and retrieve technical articles. Thomas F. Massiah (tables) Aug 19
Filters & Filtration
Biotechnology: Fermentation and downstream processing—report. Ed Bjurström (charts, tables, diagrams) (R) Feb 18
—Letter June 24
Diaphragm filter squeezes more moisture out of cake Sept 16
"Formed in place" metal membrane from Carre Inc. can be used for large variety of wastewaters (C) Feb 18
Reverse osmosis and ultrafiltration solve separation problems. Charles H. Gooding (diagrams, graphs, charts) Jan 7
Fine Chemicals—Catalysis demands for fine chemicals (N) Oct 28
Flare design—Flare system design by microcomputer. Tom Chung Tsai (table, diagram) Aug 19
—Letter Oct 28
Flocculants—Ferric sulfate is a better flocculant than aluminum sulfate (C) Aug 19
Flotation
"Ionic flotation" process removes cadmium from phosphate rock during fertilizer production (C) Feb 18
Minerex flotation agent cuts copper-processing costs (C) June 10
Flow
Agitation intensity: Key to scaling up flow-sensitive liquid systems. Richard L. Bowen, Jr. (graphs, tables) Mar 18
Bulk solids handling—report. Edwin V. Reece (charts, tables, diagrams) Apr 29
—Letters July 22-85 Sept 2
Calculator program for compressible flow in pipes. Ilona Györi (diagram, tables) Oct 28
Cleaning pipelines: A pigging primer. Peter Kipin (diagrams) Feb 4
Designing the optimum trough. Serban Constantinescu (P.N.) (chart) Dec 9
Distributors: Boosting tower performance by more than a trickle. Richard Zanetti & others (N) (graph) May 27
Emergency-relief systems are undersized: new lab instrument, called VSP, to conduct tests during simulated process upsets (C) Feb 18
Estimate boiler-blowoff steam flow. V. Ganapathy (P.N.) (chart) July 22
Estimating relief loads for thermally blocked-in liquids. Ernesto C. Valdes & Kenneth J. Svoboda (charts, tables) Sept 2
—Correction Sept 30
Flare system design by microcomputer. Tom Chung Tsai (table, diagram) Aug 19
—Letter Oct 28
Fluid-flow and flow-network software—review. Mark A. Lipowicz (diagrams) Nov 25
Orifice-meter design for steam flow. K.V. Kasipati Rao (P.N.) (nomograph) Aug 19
Predict gas/liquid-flow pressure drop. John J.J. Chen (P.N.) July 22
Predicting flowrates from positive-displacement rotary pumps. Michael L. Dillon & others (graphs, flow diagram) July 22
Predicting two-phase-flow friction loss in horizontal pipes. Zarko Olujic (graphs, flowchart, table) June 24
Preventing cavitation in butterfly valves. Hans D. Baumann (graphs, diagrams) Mar 18
Select thermowell dimensions to avoid vibration resonance from gas flow. Thomas N. Stein (P.N.) (graphs, table) July 22
- A simple, automatic method to reduce scale buildup in sewer-pump systems. Adnan Y.M. Ibrahim (P.N.) (diagram) Sept 16
Turbulent-flow friction-factor equations. D.J. Zigrang & N.D. Sylvester (P.N.) Apr 29
—Letters July 8
Use pressure gage to measure flow. Gary G. Reeves (P.N.) Oct 14
Flowmeters—NBS's acoustic-frequency gas flowmeter is patented (C) July 22
Fluids
Critical-fluid extraction removes organics from hazardous wastes (diagram) June 24
Fluid-flow and flow-network software—review. Mark A. Lipowicz (diagrams) Nov 25
Predicting flowrates from positive displacement rotary pumps. Michael L. Dillon & others (graphs, flow diagram) July 22
Supercritical fluids: still seeking acceptance. Nicholas Basta & Silke McQueen (N) Feb 4
Fluorescence Assaying—New instrumentation will use antibodies. Jenness Keene & Herbert Lass (N) Apr 29
Fluorination—Air Products plans U.S.'s first perfluorinated-organic-compounds plant at Hometown, Pa. (C) Apr 1
Fly Ash—EPRI-sponsored project in North Carolina field tests for removing mineral pollutants from coal ash (C) Jan 7
Foam—Foam-block blanket cozy for bacteria: G-P's blanket of polystyrene blocks for wintertime efficiency of biological-treatment ponds (N) Sept 16
Formaldehyde—OSHA schedules a public hearing on Feb. 13 for formaldehyde-exposure standards (C) Feb 4
OSHA moves closer to revising formaldehyde-exposure regulations (C) Apr 29
France
Fluidized-bed process for gasifying biomass will get pilot test (C) Nov 11
Industry ministry hailing out Technip (C) July 22
INRA researchers develop better way of making and utilizing the enzyme ligninase (C) Aug 19
LLDPE: Fierce competition is on among LLDPE licensors. Herb Short & others (N) (table) Feb 18
Solvent-extraction U₂ enrichment can compete with gaseous diffusion (C) Sept 16
Ways to recover heavy oil, bitumen, star at UN conference: ASVAHL process. Gerald Parkinson (N) Sept 16
Friction—Turbulent-flow friction-factor equations. D.J. Zigrang & N.D. Sylvester (P.N.) Apr 29
—Letters July 8
Fuel
CE alert: New technology
57th inventory Mar 4
58th inventory Aug 19
CE construction alert Apr 15-85, Nov 25
Cogeneration fuels—the high cost of lower heating values—CE Cost File. Paul L. Bancel (diagram) Nov 11
Synthetic fuels
CE alert: New technology
57th inventory Mar 4
58th inventory Aug 19
CE construction alert Apr 15-85, Nov 25
Synfuel plans: Are they going up in smoke? Hazel Bradford (N) Sept 2
Synthetic Fuels Corp.
Coal-water-mixture projects' funding plans cut back (C) Feb 4
Funding for some projects dropped; gets set for solicitation for project proposals (C) Mar 4
Great Plains Gasification Project may be dead as SFC refuses to fund price guarantees (C) June 10
SFC agrees to fund Great Plains—but will it have the money to spend? (C) July 8

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

House votes to rescind budget, except for \$1 million that would be given to DOE (C)	12	Aug 19	
Synfuel plans: Are they going up in smoke? Hazel Bradford (N)	*27	Sept 2	
SFC woes may continue in the next Congressional session (C)	12	Feb 4	
Fuel See also specific fuel			
Fuel Cells			
Big step ahead for fuel cells, Gerald Parkinson (N) (flow chart, diagram)	*15	July 22	
Coupling electrolytic cells to alkaline fuel cells could achieve energy savings at chlorine-caustic plants (C)	10	Sept 16	
Landfill gas used in fuel-cell test (N)	40	Mar 18	
Membrane-cell developments ease electrochemistry scaleup, Herbert C. Short & Robert Skole (diagrams)	*41	Mar 4	
Furnaces—Controlling fired heaters, Vincent G. Gomes (diagrams, tables, flow charts)	*63	Jan 7	
G			
Gages—Use pressure gage to measure flow, Gary G. Reeves (P.N.)	*119	Oct 14	
Gallium Arsenide—Modular, production-scale equipment for gallium arsenide wafers offered by Emcore (C)	11	Aug 5	
Gas			
DOE announces cheaper cleanup for coal gas (N)	32	Mar 18	
Exxon Research & Engineering Co.: H ₂ S cleanup—Kirkpatrick Honorable Mention	*82	Dec 9	
GRI's test data on new burner for firetube boilers, Pyrocore burner (C)	9	Aug 19	
—Postscripts, corrections	5	Sept 30	
Landfill-gas/cogeneration system being built for SmithKline Beckman (C)	17	Mar 18	
Landfill gas used in fuel-cell test (N)	40	Mar 18	
Microchip gas sensor under development at Sandia National Labs (C)	19	Feb 18	
Predict gas/liquid-flow pressure drop, John J. Chen (P.N.)	83	July 22	
Select thermowell dimensions to avoid vibration resonance from gas flow, Thomas N. Stein (P.N.) (graphs, table)	84	July 22	
Gas See also specific gas			
Gasification			
Cool Water coal-gasification power plant is one year old (C)	9	July 22	
DOE announces cheaper cleanup for coal gas (N)	32	Mar 18	
France to pilot test fluidized-bed process for gasifying biomass (C)	20	Nov 11	
Great Plains Gasification Project may be dead, as SFC refuses to fund price guarantees (C)	12	June 10	
SFC agrees to fund Great Plains—but will it have the money to spend? (C)	20	July 8	
Great Plains gasification plant in North Dakota is all but dead (C)	12	Aug 19	
Great Plains gasifier may keep running until next spring (C)	20	Sept 2	
Synfuel plans: Are they going up in smoke? Hazel Bradford (N)	*27	Sept 2	
Liquid-phase route for converting synthesis gas to methanol (C)	9	Oct 28	
Molten-iron coal gasification process tests scheduled at KHD, West Germany (C)	17	July 8	
PEPCO plans commercial coal-gasification/combined-cycle power plant (C)	10	Apr 29	
Shell Oil's coal gasification plant gets the nod (N)	31	May 27	
Tennessee Eastman: Acetic anhydride from coal—Kirkpatrick Award Winner (flow charts)	*79	Dec 9	
Gasoline			
Ethyl Corp. will close gasoline lead-anti-knock plant in Baton Rouge, La. (C)	17	July 8	
UOP unveils new octane-upgrading isomerization technology (C)	9	June 10	
U.S. European refiners ready for low-lead limits, Raúl Ramirez & others (charts) (N)	18	Oct 14	
Generators			
Cogeneration fuels—the high cost of lower heating values—CE Cost File, Paul L. Bancel (diagram)	215	Nov 11	
Cogeneration keeps soaring in the CPI, Nicholas Basta & Wilma Price (chart) (N)	14	Aug 5	
—Postscripts, corrections	5	Sept 30	
"Electrocogeneration" offers a possible solution to air pollutants (C)	11	June 10	
Landfill-gas/cogeneration system being built for SmithKline Beckman (C)	17	Mar 18	
PEPCO plans commercial coal-gasification/combined-cycle power plant (C)	10	Apr 29	
Genetic Engineering			
Biotechnology: Fermentation and downstream processing—report, Ed Bjurström (charts, tables, diagrams) (R)	*126	Feb 18	
Biotechnology regulation, testing etc. see Biotechnology			
Cornell U. researchers develop method of making recombinant protein at half the cost, or less, of current techniques (C)	19	Nov 11	
Patent protection starts at biotech conference: Industrial Biotechnology Assn. Jeff Trehwitt (N)	*17	June 24	
Phillips Petroleum announces new genesepting mechanism for yeasts (C)	17	May 27	
Geothermal—California's Imperial Valley to get two geothermal-electricity plants (C)	20	May 27	
Germany			
Achema: A facelift for Achema 85, Herb Short (N)	*27	May 13	
Ammonia-based catalytic process removes NO _x from stack gas (C)	12	Oct 28	
BASF will enter the engineering services business (C)	18	July 8	
Fluegas treatment for combined SO _x , NO _x acids and particulates removal (C)	9	June 24	
Krupp unveils waste-oil recycling process (C)	9	June 24	
Lurgi offering isothermal, styrene-monomer process (C)	17	Feb 18	
Molten-iron coal gasification process tests scheduled at KHD (C)	17	July 8	
Separating hydrogen from CO, hydrocarbons and other contaminants using PSA route: Bergbau process (C)	31	Aug 19	
Glass—Sandia's new method of coating with thin glass films (N)	31	Mar 4	
Gold			
Denmark's Riso's process based on thiourea could replace cyanide recovery method for gold (N)	25	Apr 1	
The lingering lure of gold spurs processing developments, Gerald Parkinson & others (N) (flowsheet/schematic)	*19	June 10	
—Correction	5	Sept 2	
Granulation—Fertilizers can be granulated in a new fluidized-bed process (C)	13	Nov 25	
Great Britain			
Biotech method will be used to decontaminate a major toxic waste site in Blackburn (C)	*27	Nov 25	
BP-Kellogg ammonia process could trim energy and production costs (C)	9	Oct 14	
British Technology Group licenses high-modulus fiber technology to Celanese (C)	11	Oct 14	
ICI computer network provides online data on plant profitability (C)	11	Sept 16	
ICI's CoAudition system: Making profitability a process-control variable, Nicholas Basta & Herbert C. Short	*86	Nov 11	
ICI-Enichem joint venture should have world's largest PVC capacity (C)	11	Sept 30	
ICI has improved version of its AMV ammonia process (C)	19	Nov 11	
ICI scaling up enzyme process for treating cyanide-bearing wastes (C)	18	Apr 15	
ICHemE offering a computer module on physical-property data (C)	11	June 10	
LLDPE: Fierce competition is on among LLDPE licensors, Herb Short & others (N) (table)	33	Feb 18	
Processes for converting natural gas to fuel-grade ethanol from Davy McKee and Humphreys & Glasgow (C)	18	Apr 15	
Radio transmission replaces cables for process controls in data system developed by PACS (C)	10	Dec 9	
Simultaneous recovery of various metals from complex sulfide ores (C)	9	Dec 9	
Sodium/sulfur battery system will be developed cooperatively by Sandia and Chloride Silent Power Ltd. (C)	9	Oct 28	
Trafalgar House purchases 29.9% stake in John Brown PLC (C)	11	July 22	
H			
Health—Stress: Are you a victim of hidden stress? Jerome Wilensky	*87	Mar 4	
Health See also Air Pollution, Environment; Labor; Safety; Water Pollution			
Heat			
Cogeneration fuels—the high cost of lower heating values—CE Cost File, Paul L. Bancel (diagram)	215	Nov 11	
Determine possible compressor icing conditions, Steven R. Johnson (P.N.) (graph)	89	Feb 4	
Radio-frequency stimulation system for heavy-oil recovery will get tryout by Uentech (C)	10	June 10	
Heat Exchangers			
Argonne and GA Technologies joint development of heat exchanger promising one to one and a half times better transfer (C)	17	Nov 11	
Ceramic units seek high-temp applications, Frank J. Tanzosh (N)	*30	Feb 10	
Costs of double-pipe and multitube heat exchangers—CE Cost File, G.P. Purohit (flowchart, graphs, tables) Part 1: Mar 4-93, Part 2:	85	Apr 1	
Estimating relief loads for thermally blocked-in liquids, Ernesto C. Valdes & Kenneth J. Svoboda (charts, tables)	77	Sept 2	
—Correction	5	Sept 30	
ICI PLC will bring "Tensa" heat-exchange-analysis technology to the U.S. (C)	17	Jan 21	
Pfaudler unveiling silicon-carbide tubing for heat exchangers (C)	17	Feb 18	
Quickly calculate temperature cross in 1-2 parallel-counterflow heat exchangers, K.N. Murty (P.N.) (diagram, chart)	99	Sept 16	
Weighted mean-temperature-difference for exchangers with phase changes, Ben Tammani (P.N.) (charts & table)	230	Nov 11	
Heat Recovery—Ceramic units seek high-temp applications, Frank J. Tanzosh (N)	*30	Feb 18	
Heat Transfer			
Estimate surface area of finned tubes, V. Ganapathy (P.N.) (nomograph)	156	May 27	
Quick design and evaluation of heat regenerators, Milorad P. Dudukovic & P.A. Ramachandran (diagrams, graphs)	63	June 10	
—Postscripts, corrections	5	Nov 11	
Thermal conductivity of some insulating materials as a function of temperature, Alejandro Anaya Durand (P.N.)	153	May 27	
Heaters & Heating			
Controlling fired heaters, Vincent G. Gomes (diagrams, tables, flow charts)	*63	Jan 7	
Quick design and evaluation of heat regenerators, Milorad P. Dudukovic & P.A. Ramachandran (diagrams, graphs)	63	June 10	
Slagging combustor burns coal efficiently, Nicholas Basta (diagram)	34	Sept 30	

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

- Specifying and operating desuperheaters.
George E. Bowie (table, chart, diagrams) May 27
—Postscripts, corrections July 22
Use boiler feedwater for hot-water heating.
Dale R. Symsek (P.N.) (flow chart) Aug 19
Hemoglobin—Hungarian process that increases the value of hemoglobin from 15¢/lb to \$1/lb commercialized (C) Aug 19
Hiring—How to unclone your organization.
Frederick Mackenzie & Martin Haydon (diagram) June 10
Hungary—Process that increases the value of hemoglobin from 15¢/lb to \$1/lb commercialized (C) Aug 19
- Hydrocarbons**
Separating hydrogen from CO, hydrocarbons and other contaminants using PSA route: Bergbau process (C) Aug 19
Signal's Li reports on membranes for separating hydrocarbons (C) Sept 16
Volatile halogenated hydrocarbons are produced by marine organisms reports MIT researchers (C) Mar 18
- Hydrogen**
Electrolytic cell produces high-purity hydrogen and oxygen from water (C) June 24
Hydrogen gas is now available for modular plants using methanol as the feedstock (C) Feb 4
Separating hydrogen from CO, hydrocarbons and other contaminants using PSA route: Bergbau process (C) Aug 19
Hydrogen Chloride—Determine the vapor pressure of HCl at low concentrations and temperatures. J. Neil Stone (P.N.) (table) Sept 16
- Hydrogen Sulfide**
Eakon Research & Engineering Co.: H₂S cleanup—Kirkpatrick Honorable Mention Dec 9
Treating hydrogen sulfide: An alternative to Claus—LO-CAT process. L.C. Hardison (flowchart, graph) Jan 21
Hydrolysis—Membranes for hydrolyzing water will be tested in a joint effort (C) Sept 2
- I**
Ideas—How to overcome resistance to new ideas. George A. Pogany Jan 7
Imaging—Image-recording device for very bright industrial processes developed by DOE and EG&G (C) Oct 28
Imports—OTA report says U.S. could reduce its dependency on foreign suppliers of strategic metals (C) Feb 4
- Incineration**
Akron, Ohio "Recycle Energy Plant" explosion (C) Jan 7
EPA controlling the burning of hazardous wastes for fuel under the RCRA (C) Nov 25
EPA's mobile incinerator will conduct a trial burn of dioxin-bearing wastes in southern Missouri (C) Jan 21
EPA lauds its mobile incinerator (C) June 24
Hazardous Substances Alternative Treatment Seminar boosts burning (N) May 27
Illinois weighs use of mobile burners (N) Nov 25
New York approves plant to build five incinerators within the city by 1990 (C) Jan 7
Ocean incineration of hazardous wastes: EPA proposes new rules (C) Mar 4
EPA voices approval but still has questions about environmental safety (C) Apr 15
Onsite waste-incineration service said to eliminate generator liability available from Waste-Tech Services (C) Sept 30
Westinghouse PCB cleanup will use its own novel incinerator (C) June 10
- India**
Bhopal tragedy
Questions still abound (C) Jan 7
India's investigation into the Bhopal methyl isocyanate disaster may be concluded by Mar. 15 (C) Feb 4
U.S. CPI start to feel effects of Bhopal tragedy. Nicholas Basta & others (N) Mar 18
UC offers its explanation of the Bhopal accident (C) Apr 1
First bill to address the implications of the Bhopal tragedy (C) Apr 1
Accusations continue to fly over the cause of the Bhopal accident (C) Aug 19
Bhopal, a year later: Learning from a tragedy. Jay Chowdhury & others (N) Dec 9
Industrial Biotechnology Assn.—Patent protection stars at biotech conference. Jeff Trewitt (N) June 24
- Information Retrieval**
Battelle surveys what technical subjects most interest companies around the globe (C) July 22
Chemical engineers are going online. Nicholas Basta (N) Oct 28
Do-it-yourself technical Russian. Carlos Torres-Marchal (tables) Feb 4
Du Pont and Phillips form partnership to produce optical disks (C) Nov 11
How to store and retrieve technical articles. Thomas F. Massiah (tables) Aug 19
ICHEM offering a computer module on physical-property data (C) June 10
- Inorganic Chemicals**
CE alert: New Technology
57th inventory Mar 4
58th inventory Aug 19
CE construction alert Apr 15-77 Nov 25
Insecticides—FIFRA: Consensus on amending the nation's pesticide law reached (C) Sept 30
Insecticides. Methyl Isocyanate see **Methyl Isocyanate**
- Isocyanate**
Instruments
Controlling fired heaters. Vincent G. Gomes (diagrams, tables, flow charts) Jan 7
Detectors: portable device that determines the nature and quantity of toxic vapors (C) Oct 14
Does your plant instrumentation work properly. Donald L. May (charts, table, diagrams) Mar 4
Emergency-relief systems are undersized: new lab instrument, called VSP, to conduct tests during simulated process upsets (C) Feb 18
Industrial temperature sensing done with fiber optics Feb 4
Level detector measures via neutron-backscatter Aug 19
New instrumentation will use antibodies. Jenness Keene & Herbert Lass (N) Apr 29
Online, in-situ composition analysis via spectrophotometry with instrument from Guide Wave (C) Nov 11
Sizing up particle analyzers. Cynthia Fabian Mascone (N) Nov 11
Transmitters: Two-wire or four-wire? Frank J. Lawson (diagrams) Apr 1
Upgrading process instruments and control systems (diagrams, graphs) Nov 11
Retrofitting control systems. John A. Moore Nov 11
Putting computers in control. Albert A. Gunkler Nov 11
- Insulation**
Determine the most economical thickness for hot-pipe insulation. Dan M. Lindamood (P.N.) (table) Apr 1
EOR: Insulating the couplings saves on EOR expenses (N) Mar 4
Spray-applied refractory fiber cuts installation downtime (table) Aug 5
Thermal conductivity of some insulating materials as a function of temperature. Alejandro Anaya Durand (P.N.) May 27
- Insurance**
EPA moves to change hazardous-waste insurance requirements (C) Sept 2
U.S. government will have to supply waste-site liability insurance (C) Sept 16
International Symposium on Biohydrometallurgy (6th)—Metals recovery makes big splash in Canada. Gerald Parkinson (diagram) (N) Sept 30
Inventions—How to promote your invention to a patent committee. Anthony P. Venturino Aug 5
Investment Recovery Assn.—Permanent home at the offices of A.P. Wherry & Assocs. (C) Mar 18
Isoamylene—Canada: Polysar plant to make high-purity isoamylene by catalytic distillation (C) Aug 19
Isomerization—UOP unveils new octane-upgrading isomerization technology (C) June 10
- Israel**
Fast metal plating, with vacuum arcs: technology under development at Tel Aviv Univ. (C) Mar 4
Microporous membranes: Gelman says new process may cut manufacturing costs (C) June 24
- Italy**
Enichem-ICI joint venture should have world's largest PVC capacity (C) Sept 30
—Postscripts, corrections Nov 25
Nonbiodegradable plastic bags and containers will be banned by 1991 (C) Feb 4
- J**
Japan
Harima's process uses algae to make unsaturated wax from tall fatty acid (C) Sept 30
Polysilastyrene: first commercial quantities being produced (C) Aug 5
Sanyo and Stone & Webster plant will demonstrate new olefins route by pyrolyzing heavy oils (C) Jan 7
Ways to recover heavy oils, bitumen, star at UN conference: HVC process; MRH process; HDM/HDS process; ROSE process. Gerald Parkinson (N) Sept 16
- Joins**
Expansion joints for chemically resistant masonry. Walter L. Sheppard, Jr. (diagram) Aug 19
—Postscripts, corrections Nov 25
Pipe loop or expansion joint?—CE Cost File. Robert K. Broyles (diagrams, tables) Oct 14
- K**
Kilns—Improve kiln utilization through non-contact temperature measurement. David S. Bartran & Kirby Nelson (P.N.) (diagram) June 24
- L**
Labeling
International groups want uniform rules for toxics. Joyce Heard & others (N) July 22
Toxics labeling: Industry groups take the initiative on uniform rules for toxics labeling (C) Sept 30
- Labor**
Du Pont's early retirement plan's popularity surprises company (C) Apr 29
ICEF warns workers of killer robots (N) Apr 29

NOTES—*Illustrated; (C) Chementator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

NIOSH

Guidelines for large-scale r-DNA fermentations. Chandra Sekhar (table, flow-diagram)	Apr 29
Respirator-selection procedure for chemicals (C)	Oct 28
New wardrobe for CPI workers. Cynthia Fabian Mascone (N)	Aug 19
OSHA	
Asbestos: EPA may regulate asbestos after all (C)	Apr 1
Ethylene oxide: OSHA decides not to set short-term exposure limits (C)	Jan 7
Formaldehyde-exposure standards: public hearing scheduled for Feb. 13 (C)	Feb 4
OSHA moves closer to revising formaldehyde-exposure regulations (C)	Apr 29
Methyl isocyanate: UC's Institute, W. Va. plant gets clean bill of health; UC's Woodbine, Ga. facility and FMC's Middleport, N.Y. plant cited (C)	Mar 4
OTA report criticizes OSHA's record during the last 13 years (C)	Apr 29
Right-to-know	
U.S. CPI start to feel effects of Bhopal tragedy. Nicholas Basta & others (N)	Mar 18
Secretary of Labor Brock moving to fill vacancies at the department (C)	May 13
Shift workers: Managing the shift worker. Gary W. Vandiver	Oct 28
Union merger: United Paperworkers International and OCAW appear set to merge in 1986 (C)	Mar 4
United Rubber Workers settle with BF Goodrich on a labor contract (C)	May 13
Updated cost factors—CE Cost File. Ivan V. Klumpp & Steven T. Slavsky (graphs, tables)	Sept 16
Part 3: Installation labor	Sept 16
Laminates—Dual-polymer laminates for corrosion-resistant equipment. J. Albert Rolston (tables)	Jan 7
Language—Do-it-yourself technical Russian. Carlos Torres-Marchal (tables)	Feb 4
Lasers—Mobile system from Switzerland achieves air-pollution measurements at distances up to 3km (C)	Sept 16
Law	
Bankruptcy limits the financial obligations of hazardous-waste-dump owners rules the Supreme Court (C)	Jan 21
Bhopal, India, tragedy	
U.S. CPI start to feel effects of Bhopal tragedy. Nicholas Basta & others (N)	Mar 18
First bill to address the implications of the Bhopal tragedy (C)	Apr 1
Biotechnology regulation, testing see Biotechnology	
Clean Air Act see Air Pollution	
Clean Water Act see Water Pollution	
Chemical Waste Management pays top-dollar penalties for violations at Vickery, O. facility (N)	May 13
Congress: Environmental laws lead the list of CPI-related legislation to be considered (C)	Jan 21
Congressional agenda has much to affect CPI. Paula Dwyer (N)	Apr 1
Energy see Energy	
Environmental see Air Pollution; Environment; Waste Disposal; Water Pollution; Water Supply	
Environmental audits: Managing your environmental audit. David L. Russell (tables)	June 24
—Letters	Sept 16
FIFRA: Consensus on amending the nation's pesticide law reached (C)	Sept 30
Illinois court finds three executives guilty of murder in connection with a death at a now-defunct silver extraction company (C)	July 8
OSHA see Labor	

Patent protection stars at biotech conference: Industrial Biotechnology Assn. Jeff Trewitt (N)	June 24
Pesticides regulation see Pesticides	
Resource Conservation and Recovery Act	
EPA broadens waste rules to include recycled materials (C)	Jan 7
"Small-quantity generators" have a problem in choosing sites for waste disposal (N)	Apr 15
Waste-law amendments are taxing EPA's resources. Paula Dwyer & Jeff Trewitt (N)	May 13
EPA moves to change hazardous-waste insurance requirements (C)	Sept 2
EPA controlling the burning of hazardous wastes for fuel under the RCRA (C)	Nov 25
Superfund see Waste Disposal	
Toxics see Toxics	
Underground tanks: Regulation coming up. Paula Dwyer (N)	Apr 29
Leaching	
Gold: The lingering lure of gold spurs processing developments. Gerald Parkinson & others (N) (flowsheets/schematic)	June 10
Metals recovery makes big splash in Canada: two conferences, CIM Metallurgical Soc. and 6th International Symposium on Biohydrometallurgy. Gerald Parkinson (diagram) (N)	Sept 30
Lead	
China to get advanced-technology "QSL" lead smelter (C)	Mar 18
Constructing with corrosion-resistant lead. Willem Brandsema (charts, table)	Oct 14
Libraries—How library spending stacks up. Wilma Price & others (N)	Feb 4
Lignin	
France: INRA researchers develop better way of making and utilizing the enzyme ligninase (C)	Aug 19
Katzen to design 25-to-30 ton/d plant for new alcohol wood-pulping process to extract lignin from wood chips (C)	Sept 30
Lignin-degrading enzymes: more than ten identified in the "white rot" fungus (C)	Sept 2
Lime—DOE discovers high-capacity SO ₂ absorbent, pressure-hydrated lime (N)	Apr 15
Liquefaction	
Coal-liquefaction consortium started up by five U.S. universities (C)	Aug 5
—Postscript	Sept 30
Coal-to-liquids gets green light (N)	Mar 18
DOE will select seven laboratories to study new "indirect" methods of converting coal to liquids (C)	Sept 30
Liquids	
Agitation intensity: Key to scaling up flow-sensitive liquid systems. Richard L. Bowen, Jr. (graphs, tables)	Mar 18
Calculate thermal conductivity for unassociated liquids. Clayton P. Kerr (P.N.)	Feb 4
Disc-bowl centrifuges. James West (diagrams, table)	Jan 7
Estimating relief loads for thermally blocked-in liquids. Ernesto C. Valdes & Kenneth J. Svoboda (charts, tables)	Sept 2
—Correction	Sept 30
Predict gas/liquid-flow pressure drop. John J.J. Chen (P.N.)	July 22
Preventing cavitation in butterfly valves. Hans D. Baumann (graphs, diagrams)	Mar 18
Programs for predicting properties with the TI-59 calculator. James H. Weber (tables)	Sept 30
Part 16: Predict surface tensions of pure liquids	Feb 4
Part 17: Predict surface tensions of binary liquid mixtures	Oct 14
Supercritical fluids: still seeking acceptance. Nicholas Basta & Silke McQueen (N)	Feb 4

M

Magnetics

Detecting pollution in groundwater with electromagnetic system (N)	Aug 5
Protect turbomachinery from magnetism. Ashok K. Mittal (P.N.) (diagrams)	June 24
Superconducting magnet for industrial applications commercialized by Eriez Magnetics (C)	June 24
Magnetohydrodynamics—DOE's MHD program achieves milestone with successful startup of coal-fired test unit at Butte, Mont. (C)	Oct 14
Maintenance	
Bearings, expansion and nonexpansion: More learning—the hard way. X.P. Riance (chart, diagram)	May 13
Part 2: More learning—the hard way—fixed and expansion shaft-bearings. X.P. Riance (diagrams)	June 10
—Letter	Aug 5
Cleaning pipelines: A pigging primer. Peter Kipin (diagrams)	Feb 4
Computerized maintenance management offers dividends for CPI firms. Nicholas Basta (N)	June 10
Lockouts save lives. Darwin E. Rhoads	Sept 2
Process automation—CE Refresher (diagrams, tables) (R)	Oct 14
13. Fault-tolerant processes. Ernest M. Cohen	Sept 16
Pumps: Downtime prompts upgrading of centrifugal pumps. Heinz P. Bloch & Donald A. Johnson (graphs, diagrams)	Nov 25
Roofs: Does the roof leak? Roger V. Morrison Part I: Jan 21 *131, Part 2:	*191
Specifying and operating desuperheaters. George E. Bowie (table, chart, diagrams)	May 27
—Postscripts, corrections	July 22
Steam traps. New trap designs trim steam losses. Richard Zanetti & Shota Ushio (N)	Sept 30
Maleic Anhydride—Monsanto announces more butane-based maleic anhydride in the works (N)	May 27
Management	
Allied-Signal Inc. begins major reorganization plan (C)	Dec 9
Amoco Corp. will now be the official name for Standard Oil Co. of Indiana (C)	May 13
Atlantic Richfield will be scaling back and restructuring its operations (C)	May 13
Audits: Managing your environmental audit. David L. Russell (tables)	June 24
—Letters	Sept 16
Critical path method: Plan your time with the critical path method. Roy J. Lyford-Pike	May 13
Dow Chemical starting cost-cutting program (C)	Dec 9
Effective coaching and counseling. Paul B. Thornton & Paul J. LeVarge	Mar 18
The golden rules of business politics. Harriet A. Katz & Eugene L. Martin	Dec 9
How to get things done. Fred Pryor	July 8
How to organize a business trip. Kenneth J. McNaughton	Oct 14
How to unclone your organization. Fredericka Mackenzie & Martin Haydon (diagram)	June 10
International business protocol. Sondra Snowdon	Nov 25
Maintenance management: Computerized maintenance management offers dividends for CPI firms. Nicholas Basta (N)	June 10
Monsanto's reorganization plan (C)	Nov 11
Motivation—Management's greatest opportunity. Leon D. Richardson	Nov 11

NOTES—*Illustrated; (C) Cementator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

Participative management: What do you know about participative management? R.D. Gilbert (charts)..... Apr 1	79	Complex binary distillation: graphically find theoretical trays and minimum reflux. Henry Z. Kister (diagrams)..... Jan 21	*97	Dow buys FilmTec, maker of thin-film membranes (N)..... July 22	23
Shift workers: Managing the shift worker. Gary W. Vandiver..... Oct 28	67	Complex multicomponent distillation: Graphically find theoretical trays and minimum reflux. Henry Z. Kister (diagrams, graphs, tables)..... May 13	*71	"Formed in place" metal membrane from Carre Inc. can be used for large variety of waste-waters (C)..... Feb 18	18
Stress: Are you a victim of hidden stress? Jerome Wilensky..... Mar 4	*87	Estimating relief loads for thermally blocked-in liquids. Ernesto C. Valdes & Kenneth J. Svoboda (charts, tables)..... Sept 2	77	Membrane-based air separators for making nitrogen from Monsanto and Dow (C)..... Mar 4	17
Union Carbide engineers speak out. Nicholas Basta (N)..... Dec 9	*21	—Correction..... Sept 30	5	Membrane-cell developments ease electrochemistry scaleup. Herbert C. Short & Robert Skole (diagrams)..... Mar 4	*41
What style of management do you prefer? W.H. Weiss..... Feb 4	*77	Graphical techniques for process engineering. John E. Johnson & D. John Morgan (diagram, graphs, tables)..... July 8	72	Membranes for hydrolyzing water will be tested in a joint effort (C)..... Sept 2	17
Wico Chemical Corp. will drop "chemical" from its title (C)..... May 13	16	Heat regenerators: Quick design and evaluation. Milorad P. Dodukovic & P.A. Ramachandran (diagrams, graphs)..... June 10	63	Membranes will be investigated in a process to recover organic solvents from waste gas streams (C)..... Aug 5	11
Manganese		—Postscripts, corrections..... Nov 11	5	Microporous membranes: Gelman says new process may cut manufacturing costs (C)..... June 24	11
Argonne's two-step route for refining Co and Mn from low and medium-grade ores (C)..... Apr 29	11	Modeling chemical reactors. Robert W. Wansbrough (tables, graphs)..... Aug 5	95	Monsanto seeks to expand Prism separators into water removal (C)..... May 13	14
Canada: Wabush Mines studying construction of manganese extraction plant (N)..... Feb 18	42	Plant Notebooks see Plant Notebook		Nitrogen-from-air costs cut by a third to a half with membranes (C)..... Sept 16	9
Marine Organisms—Volatile halogenated hydrocarbons are produced by marine organisms reports MIT researchers (C)..... Mar 18	19	Predict saturation temperature as a function of vapor pressure. Mangesh P. Wagle (tables)..... June 10	*77	Reverse osmosis and ultrafiltration solve separation problems. Charles H. Gooding (diagrams, graphs, charts)..... Jan 7	*56
Materials		Sizing relief valves for fire emergencies. R.A. Crozier, Jr. (graphs, tables)..... Oct 28	49	Signal's Li reports on membranes for separating hydrocarbons (C)..... Sept 16	9
Alloys: Selecting alloys for chloride service. Gary N. Kirby (charts & tables) Part 1: Feb 4 '81, Part 2:..... Mar 4	*99	Statistics—CE Tutorial. Robert E. Miller (diagrams, graphs, tables) (R)..... Jan 21	107	Metallurgy	
Bright future for treated minerals (N)..... Sept 16	25	4. Means and variances..... Jan 21	107	Argonne's two-step route for refining Co and Mn from low and medium-grade ores (C)..... Apr 29	11
Ceramics: Sintered alpha-silicon carbide—an advanced material for CPI applications. Robert W. Lashway (graph, tables)..... Dec 9	121	—Postscripts..... Sept 30	75	Canada: Wabush Mines studying construction of manganese extraction plant (N)..... Feb 18	42
Composite materials: New impetus for hi-tech research—six U.S. government-supported centers. Rex Rhein (N)..... Aug 5	*19	5. Analysis of variance..... Mar 18	173	China to get advanced-technology "QSL" lead smelter (C)..... Mar 18	19
Corrosion control in steam and condensate lines. Paul F. Pelosi & Carl J. Capubianca (chart, tables)..... June 24	61	6. Time-series analysis..... June 10	85	Consep Membranes to begin commercialization of membranes for food processing and metals recovery (C)..... Feb 4	10
Dual-polymer laminates for corrosion-resistant equipment. J. Albert Robston (tables)..... Jan 7	*89	7. Correlation and regression..... Sept 30	71	Denmark's Riso process based on thiourea could replace cyanide recovery method for gold (N)..... Apr 1	25
Engineering resins aim at wider CPI markets. Cynthia Fabian Mascone (N)..... Oct 14	*27	Timing a cooling tower. Jerry D. Warner (tables, graph) Part 1: Sept 30 '95, Part 2:..... Oct 28	*71	Gold: The lingering lure of gold spurs processing developments. Gerald Parkinson & others (N) (flowsheet/schematic)..... June 10	*19
Expansion joints for chemically resistant masonry. Walter L. Sheppard, Jr. (diagram)..... Aug 19	79	—Postscripts, corrections..... Nov 11	5	—Correction..... Sept 2	5
—Postscripts, corrections..... Nov 25	5	Ventilating CPI buildings. John D. Constance (chart, tables, diagrams)..... Dec 9	89	Hydrometallurgy: Winning metals with water. J.H. Canterford (flow charts, diagram, table)..... Oct 28	*41
FRP: Pultruded fiberglass-reinforced plastic (FRP): A structural solution for corrosive environments. A. Keith Liskey..... Nov 11	*221	Measurements		Kennecott and Outokumpu sign development and marketing agreement for improved copper-conversion process (C)..... Jan 7	17
Lead: Constructing with corrosion-resistant lead. Willem Brandsema (charts, table)..... Oct 14	*111	Detecting pollution in groundwater with electromagnetic system (N)..... Aug 5	21	Metals recovery makes big splash in Canada: two conferences, CIM Metallurgical Soc. and 6th International Symposium on Biohydrometallurgy. Gerald Parkinson (diagram) (N)..... Sept 30	*19
Preventing corrosion during mothballing. Ronald J. Twigg..... Sept 16	*91	Does your plant instrumentation work properly? Donald L. May (charts, table, diagrams)..... Mar 4	67	Minerac flotation agent cuts copper-processing costs (C)..... June 10	11
Preventing galvanic corrosion in marine environments. T.S. Lee (graphs, tables)..... Apr 1	89	Improve kiln utilization through noncontact temperature measurement. David S. Bartran & Kirby Nelson (P.N.) (diagram)..... June 24	65	Simultaneous recovery of various metals from complex sulfide ores (C)..... Dec 9	9
Stockpile: White House backs plan to reduce National Defense Stockpile (C)..... July 22	12	Industrial temperature sensing done with fiber optics..... Feb 4	*29	Metals	
Sulfur concrete for acid resistance. Scott S. Pickard (tables)..... July 22	*77	Level detector measures via neutron-backscatter..... Aug 19	109	CE alert: New technology	
Using tests and service histories to select metals and alloys. William L. Silence & others (charts, tables)..... Apr 29	79	Measure composition in situ via fiber-optic spectrophotometry..... Dec 9	12	57th inventory..... Mar 4	77
Updated cost factors—CE Cost File. Ivan V. Klumpp & Steven T. Slavy (graphs, tables)..... July 22	73	Measuring particles from combustion (N)..... June 24	*35	58th inventory..... Aug 19	61
Materials Handling		Microchip gas sensor under development at Sandia National Labs (C)..... Feb 18	*37	CE construction alert Apr 15-78..... Nov 25	48
Bulk solids handling—report. Edwin V. Reece (charts, tables, diagrams)..... Apr 29	38	Microcomputer process control. William L. Schweber (graphs, table, diagrams)..... Aug 5	*56	Database for new metal alloys being jointly developed by ASM and NBS (N)..... Apr 15	37
—Letters July 22-5..... Sept 2	5	Mobile system from Switzerland achieves air-pollution measurements at distances up to 3km (C)..... Sept 16	*53	Novel technique for the removal of heavy metals from water (C)..... Dec 9	11
Modify your batch reactor's material-transfer system to avoid problems. James D. King & Kevin M. Egan (P.N.) (diagram)..... May 27	153	Pressure measurement—report. William J. Demorest Jr. (diagrams, tables, charts) (R)..... Sept 30	*119	OTA report says U.S. could reduce its dependency on foreign suppliers of strategic metals (C)..... Feb 12	12
Shortcut methods for estimating solids inventory. Raul F. Prieto (P.N.) (charts)..... Nov 11	229	Solids monitor offers accuracy and rangeability..... Feb 18	75	Preventing galvanic corrosion in marine environments. T.S. Lee (graphs, tables)..... Apr 1	89
Slurry pipelines see Coal		Use pressure gage to measure flow. Gary G. Reeves (P.N.)..... Oct 14		Selecting alloys for chloride service. Gary N. Kirby (charts & tables) Part 1: Feb 4 '81, Part 2:..... Mar 4	*99
Mathematics		Meetings—CE Alert: Meetings 1985. One way to stay abreast of changing technology and equipment..... Jan 7		USBM report gives data on metals (N)..... Feb 18	42
Calculating minimum reflux. Victor E. Arnold (diagram, graphs, table)..... Feb 4	59	Meetings See also specific meeting		Using tests and service histories to select metals and alloys. William L. Silence & others (charts, tables)..... Apr 29	79
		Membranes		Meters	
		Aquanautics' innovative membrane will be studied for blood purification (C)..... May 13	14	Equations for orifice-meter sizing. Denis J. Zigrang & Nicholas D. Sylvester (P.N.)..... Feb 4	91
		Biotechnology: Fermentation and downstream processing—report. Ed Bjurstrom (charts, tables, diagrams) (R)..... Feb 18	*126		
		Ultrafiltration membranes..... Feb 18	151		
		—Letter..... June 24	5		
		Consep Membranes to begin commercialization of membranes for food processing and metals recovery (C)..... Feb 4	10		

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

—Postscripts, corrections	Apr 15
Orifice-meter design for steam flow. K.V. Kasipati Rao (P.N.) (nomograph)	Aug 19
Methanation—British Gas' plan to scale up CO-to-methane process at Scottish plant set back by explosion (C)	Apr 1
Methane—SIR process obtains methane via electrochemistry using carbonated water (C)	July 8
Methanol	
Du Pont wins approval to test-market methanol fuel blends for autos (C)	Feb 4
Ethanol producers are elated at news of the Du Pont waiver (C)	Feb 4
France to pilot test fluidized-bed process for gasifying biomass (C)	Nov 11
Hydrogen gas is now available from modular plants using methanol as the feedstock (C)	Feb 4
Liquid-phase route for converting synthesis gas to methanol (C)	Oct 28
Methanol future: Not that bad (N) (table)	Aug 19
Methyl Isocyanate	
Du Pont's new pesticide process using methyl isocyanate starts up at La Porte, Tex. (C)	June 24
FMC will build facility at Institute, W.Va. to convert MIC to technical-grade carbonyl (C)	May 13
UC's Bhopal, India disaster see India	
UC's Institute, W.Va. facility see Safety	
West Virginia's Kanawha Valley's emergency-response plans criticized (N)	Apr 15
Methylene Chloride—EPA takes action on three chemicals (N)	Nov 11
Methylene Isocyanate—DOT issues new transport safety standards for MIC (C)	Oct 28
Mexico—CPI fares well during recent quake (C)	Oct 14
Microelectronics—A challenge to chemical engineers—microelectronics. Graydon B. Larabee (tables, graphs, diagrams)	June 10
—Letter	Sept 30
Middle East—Chemical engineering: A changing profession—report (charts)	Jan 7
International outlook: Africa and Middle East	Jan 7
Minerals	
Bright future for treated minerals: Kline study (N)	Sept 16
CE alert: New technology	Mar 4
57th inventory	Nov 25
CE construction alert Apr 15-79	Nov 25
Metals recovery makes big splash in Canada: two conferences, CIM Metallurgical Soc. and 6th International Symposium on Biohydrometallurgy. Gerald Parkinson (diagram) (N)	Sept 30
Simultaneous recovery of various metals from complex sulfide ores (C)	Dec 9
Mining	
New ways to recover hard-to-reach petroleum. Gerald Parkinson (N) (flow diagram)	Apr 15
Solution process to remove nahcolite from sodium mineral deposits being tested by two firms (C)	Oct 28
Mixing—Motionless mixers stir up sluggish markets. Jay Chowdhury & others (N)	May 13
Mixtures	
Estimate the eutectic conditions of binary mixtures. S.M. Walas (P.N.) (graph)	Aug 19
—Correction	Sept 30
Programs for predicting properties with the TI-59 calculator. James H. Weber (tables)	Part 17: Predict surface tensions of binary liquid mixtures
Oct 14	
Models	
Modeling chemical reactors. Robert W. Wansbrough (tables, graphs)	Aug 5
Project evaluation: A review of recent developments. Terence E. Powell (charts, tables)	Nov 11

3	Molecular Sieves—Georgia Institute of Technology sets up academic program to study zeolites and molecular sieves (N)	May 27
83	Monomers	
11	Lurgi offering isothermal, styrene-monomer process (C)	Feb 18
18	Styrene monomer single-step isothermal process: New styrene process pares production costs. Herbert C. Short & Lois Bolton (flow chart)	Aug 19
10		
11		
20		
9	Nahcolite—Solution process to remove nahcolite from sodium mineral deposits being tested by two firms (C)	Oct 28
9	Naphtha—Ample petrochem feeds, says SRI study (N) (table)	Nov 25
9	National Plastics Exposition—New products steal the plastics show (N)	July 22
24	National Science Foundation—Engineering Research Centers (6) set up (C)	Apr 29
11	Natural Gas	
11	Canadians establish new energy pricing (N)	Apr 29
15	CE alert: New technology	Mar 4
15	57th inventory	Aug 19
15	58th inventory	Nov 25
15	CE construction alert Apr 15-79	Nov 25
34	Chevron USA will invest \$400 million in oil and gas processing facilities at Gaviota, Calif. (C)	Jan 7
40	FERC rules governing pipeline transportation of gas may result in price cut for industrial consumers (C)	Oct 28
12	Gasification see Gasification	
12	Offshore	
9	OTA sees trouble ahead for U.S. offshore oil and gas reserves (C)	May 27
9	Processes for converting natural gas to fuel-grade ethanol from Davy McKee and Humphreys & Glasgow (C)	Apr 15
51	Substitute natural gas made from coal at a cost of \$5.08/million Btu in Rockwell's AFHP process (C)	Nov 25
5	Wyoming approves expansion of Exxon's La Barge gas-processing complex (C)	June 24
22	Netherlands—LLDPE: Fierce competition is on among LLDPE licensors. Herb Short & others (N) (table)	Feb 18
31	Nitrogen	
25	Membrane-based air separators for making nitrogen from Monsanto and Dow (C)	Mar 4
77	Membranes cut nitrogen-from-air costs by a third to a half (C)	Sept 16
48	Nitrogen Oxide—DOE seeking to scale up process for cleaning up both SO _x and NO _x (C)	Apr 29
19	UOP, Inc. will scale up DOE process (C)	Nov 11
9	Noise Control	
31	Avoid erratic control operation by suppressing relay arcs. James McAlister (P.N.) (nomograph, diagram)	Mar 4
10	Preventing cavitation in butterfly valves. Hans D. Baumann (graphs, diagrams)	Mar 18
18	North America—Chemical engineering: A changing profession—report (charts)	Jan 7
18	International outlook: North America	Jan 7
86	Nozzles—Sizing gas pressure-relief nozzles. Serban Constantinescu (P.N.)	Apr 29
5	Nylon—Du Pont announces a new amorphous nylon for auto applications—"Bexloy" (C)	Feb 4
87		
95	Occupational Safety and Health Administration	
187	OTA report criticizes OSHA's record during the last 13 years (C)	Apr 29

31	Pendergrass, John, undergoing clearance process as new OSHA head (C)	Nov 11
17	Rowland, Robert resigns, after being cleared of conflict-of-interest charges (C)	June 10
30	OSHA See also Labor; Safety	
30	Oceania—Chemical engineering: A changing profession—report (charts)	Jan 7
30	International outlook: Oceania	Jan 7
30	Oils & Fats—Texas A&I's Serth develops continuous distillation route to produce essential oils (C)	Sept 16
9	Olefins	
16	Phillips Petroleum combines two olefin conversion processes in Lyondell Petrochemical propylene facility (C)	Nov 25
19	Sanyo and Stone & Webster plant will demonstrate new olefins route by pyrolyzing heavy oils (C)	Jan 7
19	Optics—Du Pont and Phillips form partnership to produce optical disks (C)	Nov 11
17	Optimization—UC offers process-optimization service (C)	Apr 15
9	Organic Chemicals	
78	CE alert: New technology	Mar 4
62	57th inventory	Aug 19
49	CE construction alert Apr 15-79	Nov 25
79	Organic Compounds—Air Products plans U.S.'s first perfluorinated-organic-compounds plant at Homotown, Pa. (C)	Apr 1
63	Oxidation—VerTech waste treatment process is keyed to mile-long reactor. Gerald Rappe (diagram, flowchart)	Apr 15
48	Oxygen—Electrolytic cell produces high-purity hydrogen and oxygen from water (C)	June 24
10		
18		
18	P	
18	Packaging—Direct deposition of metal circuits on semiconductors may be possible from the vapor phase says IBM (C)	Feb 18
13	Packing	
12	Distributors: Boosting tower performance by more than a trickle. Richard Zanetti & others (N) (graph)	May 27
33	Structured is the byword in tower-packing world. Richard Zanetti & others (N)	Mar 4
17	Paper See Pulp & Paper	
17	Patents	
17	How to promote your invention to a patent committee. Anthony P. Venturino	Aug 5
9	Patent protection stars at biotech conference: Industrial Biotechnology Assn. Jeff Trehwitt (N)	June 24
10	Pentachlorophenol—Microbial process for removing PCP from soil (C)	Sept 30
18	Peptides—Los Alamos scientists discover peptide produced naturally by the monkey flower and jimson weed could be used to recover toxic metals (C)	July 22
105	Personnel-protection Equipment—New wardrobe for CPI workers. Cynthia Fabian Mascone (N)	Aug 19
149	Pesticides	
22	Du Pont's new pesticide process using methyl isocyanate starts up at La Porte, Tex. (C)	June 24
32	EPA issues final water rule for pesticide makers (N)	Oct 14
85	Petro Expo '85—Preview: New products and services	Mar 18
11	Petrochemicals	
11	Argentina will complete petrochemical complex at Bahia Blanca (C)	Aug 19
18	Canadians establish new energy pricing (N)	Apr 29
22	Feedstocks	
22	Ample petrochem feeds, says SRI study (N) (table)	Nov 25
53	Petro Expo '85—Preview: New products and services	Mar 18
19	Sanyo and Stone & Webster plant will demonstrate new olefins route by pyrolyzing heavy oils (C)	Jan 7

Petroleum

- Biomass see Biomass**
 Canadians establish new energy pricing (N) Apr 29
 CE alert: New technology Mar 4
 57th inventory Aug 19
 CE construction alert Apr 15-81 Nov 25
 Chevron USA will invest \$400 million in oil and gas processing facilities at Gaviota, Calif. (C) Jan 7
 Demand will be stable in the U.S. this year: EIA's "Short-Term Energy Outlook" (C) Mar 4
Energy see Energy
 Enhanced-oil-recovery: El Aquitaine's new bipolymer, scleroglucan (C) June 10
 Enhanced oil recovery: IIT will pursue improved version of alkaline injection (C) July 22
 EOR: Insulation saves on EOR expenses (N) Mar 4
 EOR: Research brightens future of enhanced oil recovery, Gerald Parkinson (diagrams, chart) (N) Mar 4
 Nalco offering all-organic oil/water-separation chemicals (C) Apr 15
 New ways to recover hard-to-reach petroleum, Gerald Parkinson (N) (flow diagram) Apr 15
 Offshore: OTA sees trouble ahead for U.S. offshore oil and gas reserves (C) May 27
 Radio-frequency stimulation system for heavy-oil recovery will get tryout by Uentech (C) June 10
 Refineries and refining
 Aramco stops construction of two oil refineries, reports Bechtel (C) Apr 1
 Solvent desalting that employs equipment in existing crude units can be done with Lumus Crest's RSR process (C) Sept 30
 —Postscripts, corrections Nov 25
 SRM: Helping to detect catalyst poisons (N) Feb 18
 UOP unveils new octane-upgrading isomerization technology (C) June 10
 U.S., European refiners ready for low-lead limits. Raúl Ramirez & others (charts) (N) Oct 14
 Zeolite catalyst for fluidized-catalytic cracking from Katalistiks (C) June 10
 Saudi Arabia's move to boost crude-oil production will push down world prices (C) Sept 30
 UOP will study the coprocessing of coal and residual oil under a DOE grant (C) Jan 21
 UN's third international conference on heavy crude and tar sands: Ways to recover heavy oil, bitumen, star at conference, Gerald Parkinson (N) (flow-scheme) Sept 16
 Waste-oil recycling process unveiled by Kupp (C) June 24
 Phenylalanine—For sale? Slightly used phenylalanine plant, Nicholas Basta (N) Nov 25
Phosphate
 "Ionic flotation" process removes cadmium from phosphate rock during fertilizer production (C) Feb 18
 TVA developing one-step phosphate-ore beneficiation process (C) Apr 15
 Photography—Photogrammetry and computer-aided piping design, John F. Kenefick & Richard D. Chirillo (diagrams) Feb 18
 Physical Properties—ICHemE offering computer module on physical-property data (C) June 10
 Piggling primer: Cleaning pipelines, Peter Kipin (diagrams) Feb 4
 Pilot Plants—The pilot plant—report, Jack G. Lowenstein (flowcharts) (R) Dec 9
Pipe & Pipelines
 Calculator program for compressible flow in pipes, Ilona Györi (diagram, tables) Oct 28
 Cleaning pipelines: A piggling primer, Peter Kipin (diagrams) Feb 4

- Coal-slurry pipeline to be built by U.S.S.R. with Occidental Petroleum help (C) Jan 7
 Corrosion control in steam and condensate lines, Paul F. Pelosi & Carl J. Cappabianca (chart, tables) June 24
 Determine the most economical thickness for hot-pipe insulation, Dan M. Lindamood (P.N.) (table) Apr 1
 Flare system design by microcomputer, Tom Chungshu Tsai (table, diagram) Aug 19
 —Letter Oct 28
 Natural gas: FERC rules governing pipeline transportation of gas may result in a price cut for industrial consumers (C) Oct 28
 Photogrammetry and computer-aided piping design, John F. Kenefick & Richard D. Chirillo (diagrams) Feb 18
 Pipe loop or expansion joint?—CE Cost File, Robert K. Broyles (diagrams, tables) Oct 14
 Predicting two-phase-flow friction loss in horizontal pipes, Zarko Olujic (graphs, flowchart, table) June 24
 Shortcut methods for determining optimum line sizing in SI units, Norbert J. Bell (chart, nomograph, table) (P.N.) Oct 14
 Shurries: coal-oil-water mixtures see Coal
 Turbulent-flow friction-factor equations, D.J. Zigrang & N.D. Sylvester (P.N.) Apr 29
 —Letters July 8
Plant Design
 Bulk solids handling—report, Edwin V. Reece (charts, tables, diagrams) Apr 29
 —Letters July 22-5, Sept 2
 Chemical plant safety: the longer, deeper view (Ed) Apr 1
 Eliminating potential process hazards—report, Trevor A. Kletz (diagrams, tables, flowchart) (R) Apr 1
 —Letters June 10-5, Dec 9
 Expert systems gear up for process synthesis jobs, Jay Chowdhury (N) (diagram) Aug 19
 Forestalling construction problems, Vijay K. Pathak & Inder S. Rattan (diagrams) Nov 25
 The pilot plant—report, Jack G. Lowenstein (flowcharts) (R) Dec 9
 Plant Genetics—Fluor and Bio-Foods will pilot-test method of reproducing plant cells in solution (C) June 24
 Plant Location—Offshore: Swedwards scaling back business in barge-mounted chemical plants (C) Jan 21
Plant Notebook
 Avoid erratic control operation by suppressing relay arcs, James McAlister (nomograph, diagram) Mar 4
 Calculate thermal conductivity for unassociated liquids, Clayton P. Kerr Feb 4
 Designing the optimum trough, Serban Constantinescu (chart) Dec 9
 Determine the most economical thickness for hot-pipe insulation, Dan M. Lindamood (table) Apr 1
 Determine possible compressor icing conditions, Steven R. Johnson (graph) Feb 4
 Determine the vapor pressure of HCl at low concentrations and temperatures, J. Neil Stone (table) Sept 16
 Equations for orifice-meter sizing, Denis J. Zigrang & Nicholas D. Sylvester Feb 4
 —Postscripts, corrections Apr 15
 Estimate boiler-blowoff steam flow, V. Ganapathy (chart) July 22
 Estimate equilibrium for exponential change, William L. Klotz (graphs) Mar 4
 Estimate the eutectic conditions of binary mixtures, S.M. Walas (graph) Aug 19
 —Correction Sept 30
 Estimate relative volatility quickly, W.P. Wagle Apr 29
 Estimate surface area of finned tubes, V.

- Ganapathy (nomograph) May 27
 Extend the life of slurry agitators, S. Raghavachari (diagrams) Apr 1
 Improve kiln utilization through noncontact temperature measurement, David S. Bartran & Kirby Nelson (diagram) June 24
 Modify your batch reactor's material-transfer system to avoid problems, James D. King & Kevin M. Egan (diagram) May 27
 A more accurate equation for estimating horizontal-tank volumes, J.J.J. Chen May 27
 1984 Plant Notebook awards Jan 7
 Operating performance of reciprocating or positive-displacement compressors, Michael Polonyi (chart) Dec 9
 Orifice-meter design for steam flow, K.V. Kasipati Rao (nomograph) Aug 19
 Predict gas/liquid-flow pressure drop, John J. Chen July 22
 Prevent plug valves from sticking and jamming, Adnan Irfayem (diagrams) Apr 29
 Protect turbomachinery from magnetism, Ashok K. Mittal (diagrams) June 24
 Quickly calculate temperature cross in 1-2 parallel-counterflow heat exchangers, K.N. Murty (diagram, chart) Sept 16
 Select thermowell dimensions to avoid vibration resonance from gas flow, Thomas N. Stein (graphs, table) July 22
 Shortcut methods for determining optimum line sizing in SI units, Norbert J. Bell (chart, nomograph, table) Oct 14
 Shortcut methods for estimating solids inventory, Raul F. Prieto (charts) Nov 11
 SI units simplify calculations, P.G. Cooper Mar 4
 A simple, automatic method to reduce scale buildup in sewer-pump systems, Adnan Y.M. Irfayem (diagram) Sept 16
 Sizing gas pressure-relief nozzles, Serban Constantinescu Apr 29
 Startup of centrifugal pumps in flashing or cryogenic liquid service, Inder S. Rattan & Vijay K. Pathak (diagrams) Apr 1
 Thermal conductivity of some insulating materials as a function of temperature, Alejandro Anaya Durand May 27
 Turbulent-flow friction-factor equations, D.J. Zigrang & N.D. Sylvester Apr 29
 —Letters July 8
 Use boiler feedwater for hot-water heating, Dale R. Symsek (flow chart) Aug 19
 Use pressure gage to measure flow, Gary G. Reeves Oct 14
 Weighted mean-temperature-difference for exchangers with phase changes, Ben Tammami (charts & table) Nov 11
Plant Operation
 Boilers: Operating boilers intermittently, Charles A. Faust (graph, diagram, table) July 8
 Cooling towers: Timing a cooling tower, Jerry D. Warner (tables, graphs) Part 1: Sept 30 '85, Part 2 Oct 28
 —Postscripts, corrections Nov 11
 Distributed computer systems for the plant, J. Ara Barsamian (diagram) Feb 18
 Does your plant instrumentation work properly? Donald L. May (charts, table, diagrams) Mar 4
 Eliminating potential process hazards—report, Trevor A. Kletz (diagrams, tables, flowchart) (R) Apr 1
 —Letters, June 10-5, Dec 9
 Hazard identification, analysis and control, Henry Ozog (tables, graph, diagrams) Feb 18
 Lockouts save lives, Darwin E. Rhoads Sept 2
 Particulate tests: Do you need a fourth particulate-sampling test? Gerald A. Rich (diagram, table) Aug 5
 The pilot plant—report, Jack G. Lowenstein (flowcharts) (R) Dec 9
 Power consumption of mechanical double-seals, Frederic W. Buse (graphs and ta-

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

bles, figures) Dec 9	125	new fiber, Spectra-900 (C) Mar 4	17	When job dissatisfaction strikes. James E. McAlister Apr 29	69
Preventing corrosion during mothballing. Ronald J. Twigg Sept 16	*91	LLDPE: Pierce competition is on among LLDPE licensors. Herb Short & others (N) (table) Feb 18	33	Project Engineering	
Specifying and operating desuperheaters. George E. Bowie (table, chart, diagrams) May 27	119	Polymerization—Ethylene/propylene copolymerization benefits from new titanium catalysts (C) July 22	10	Forestalling construction problems. Vijay K. Pathak & Inder S. Rattan (diagrams) Nov 25	69
—Postscripts, corrections July 22	5	Polymers	19	The pilot plant—report. Jack G. Lowenstein (flowcharts) (R) Dec 9	*62
Upgrading process instruments and control systems (diagrams, graphs) Nov 11	*171	Dow expands Texas polymer research facilities (N) July 22	19	Project scheduling techniques. John M. Veranth (diagrams, charts, table) Apr 15	61
Retraining control systems. John A. Masone Nov 11	172	Dual-polymer laminates for corrosion-resistant equipment. J. Albert Rolston (tables) Jan 7	*89	A review of recent developments in project evaluation. Terence E. Powell (charts, tables) Nov 11	187
Valves: Selecting pressure relief valves. Gary B. Emerson (diagrams) Mar 18	195	Effects of aging on polymer blends will be researched (C) Dec 9	11	Steam-system design: How it evolves—report. John F. Peterson & William L. Mann (charts, diagrams, tables) (R) Oct 14	*62
Written instructions: Follow these rules to write good instructions. Richard A. Kujawski Apr 15	107	Electrically conductive family of polymers available from Polaroid (C) Sept 16	10	Propylene	
Plasma Systems		Growth forecast for polymer composites (N) Feb 18	41	Ethylene/propylene copolymerization benefits from new titanium catalysts (C) July 22	10
NMAB report says pace of U.S. research in plasma processing must pick up (C) Mar 18	18	Signal Research's polymer conducts protons at room temperature (C) Dec 9	10	Phillips Petroleum combines two olefin conversion processes in Lyondell Petrochemical propylene facility (C) Nov 25	16
SKF Steel breaks ground on its first Plasma-chrome plant (C) Mar 18	18	Polypropylene	22	Protein	
Plastic Film		Hard task: Choosing a route for making polypropylene. Herb Short & Wilma Price (N) (flow charts) July 8	*83	Canada's Alberta Research Council announces r-DNA results using yeasts, producing protamine (C) May 27	17
Italy will ban nonbiodegradable plastic bags and containers by 1991 (C) Feb 4	11	Himont Inc.: Polypropylene (Spheripol process)—Kirkpatrick Honorable Mention (N) Apr 15	34	Hungarian process that increases the value of hemoglobin from 15¢/lb to \$1/lb commercialized (C) Aug 19	9
Soviet policies threaten cancellation of plastic film project (C) Aug 5	12	Unipol PP: A gas-phase route to polypropylene. Steven P. Sawin & Case J. Baas (flowsheet) May 27	42	Phillips Petroleum announces gene-splicing mechanism for yeasts (C) May 27	17
Plastics		Unipol PP: A gas-phase route to polypropylene. Steven P. Sawin & Case J. Baas (flowsheet) May 27	10	Recombinant protein: Cornell U. researchers develop method of making a recombinant protein at half the cost, or less, of current techniques (C) Nov 11	19
Additives charted in study (N) Sept 16	26	Polysaccharide—EOR projects may benefit from Elf Aquitaine's new biopolymer, scleroglucan (C) June 10	10	Public Relations—Use personal public relations to build your career. Donald M. Levin Sept 16	81
Allied targets engineering plastics for a \$200-million expansion (C) May 13	13	Polysilicon—Polycrystalline Silicon Technology offering lab-scale polysilicon-production plants (C) July 8	17	Pulp & Paper	
CE alert: New technology		Polystyrene		CE alert: New technology	
57th inventory Mar 4	80	G-P's blanket of polystyrene blocks for wintertime efficiency of biological-treatment ponds (N) Sept 16	28	58th inventory Aug 19	66
58th inventory Aug 19	63	Polystyrene spheres: world's first space product is on the market (C) Aug 5	10	CE construction alert Apr 15-83 Nov 25	52
CE construction alert Apr 15-82 Nov 25	51	Polyvinyl Chloride—Enichem-ICI joint venture should have world's largest PVC capacity (C) Sept 30	11	France: INRA researchers develop better way of making and utilizing the enzyme ligninase (C) Aug 19	10
Dual-polymer laminates for corrosion-resistant equipment. J. Albert Rolston (tables) Jan 7	*89	—Postscripts, corrections Nov 25	5	Katzen to design 25-to-30 ton/d plant for new alcohol wood-pulping process (C) Sept 30	9
Engineering resins aim at wider CPI markets. Cynthia Fabian Mascone (N) Oct 14	*27	Powders—Powder and Bulk Solids Show—1985: New product highlights Apr 29	*29	Lignin-degrading enzymes: more than ten identified in the "white rot" fungus (C) Sept 2	18
FRP: Pultruded fiberglass-reinforced plastic (FRP): A structural solution for corrosive environments. A. Keith Liskey Nov 11	*221	Pressure	83	Louisiana pulp mill installs single evaporator train (N) Aug 19	*23
Hercules moves deeper into plastics with joint venture with Industries PPD Inc. (C) Mar 4	19	Predict gas/liquid-flow pressure drop. John J. Chen (P.N.) July 22	45	Sulfur and chlorine-free pulping/bleaching process proposed by Canadian inventor, Steven Kooi (C) Jan 21	19
Italy will ban nonbiodegradable plastic bags and containers by 1991 (C) Feb 4	11	Predicting two-phase-flow friction loss in horizontal pipes. Zarko Olujic (graphs, flowchart, table) June 24	*56	Pumps	
Los Alamos licensing patented method for producing very smooth surfaces on plastics (C) Nov 25	15	Pressure measurement—report. William J. Demorest Jr. (diagrams, tables, charts) (R) Sept 30	85	Downtime prompts upgrading of centrifugal pumps. Heinz P. Bloch & Donald A. Johnson (graphs, diagrams) Nov 25	35
National Plastics Exposition: New products steal the plastics show (N) July 22	*25	Sizing gas pressure-relief nozzles. Serban Constantinescu (P.N.) Apr 29	86	Exxon effort to upgrade medium-duty pumps is gaining momentum (C) Aug 5	9
Plaspec Interactive Data Bank will be set up (C) May 27	18	Turbulent-flow friction-factor equations. D.J. Zigrang & N.D. Sylvester (P.N.) Apr 29	5	Fiberglass pumps feature air-cooled gland Oct 28	*31
Transparent plastic, "electrochromic" material PITN, is also a good conductor of electricity (C) Dec 9	10	Prices & Pricing—Transfer pricing—CE Cost File. Kenneth E. Lunde (tables) Feb 4	*85	New pump models aim at satisfying CPI needs. Gerald Parkinson (N) (diagram) Apr 1	*14
Waste-plastic recycling unit: Didier gets contract for plant in Pakistan (C) June 24	10	—Postscripts, corrections Nov 11	5	Nonmetallic pump features redesigned seal, new material Sept 2	*43
Plastics See also specific plastic		Process Equipment		Power consumption of mechanical double-seals. Frederic W. Buse (graphs, tables) Dec 9	125
Plating—Fast metal plating, with vacuum arcs: technology under development at Israel's Tel Aviv Univ. (C) Mar 4	19	Achema: A facelift for Achema 85. Herb Short (N) May 13	*27	Predicting flowrates from positive-displacement rotary pumps. Michael L. Dillon & others (graphs, flow diagram) July 22	*57
Polycarbonate—Dow enters the polycarbonate market with Calibre resins (C) May 27	19	Emergency-relief systems are undersized: new lab instrument, called VSP, to conduct tests during simulated process upsets (C) Feb 18	18	Pump lasts 3½ times longer than standard ANSI pumps Oct 14	*43
Polychlorinated Biphenyls		Engineering resins aim at wider CPI markets. Cynthia Fabian Mascone (N) Oct 14	*27	Selecting positive-displacement pumps—report. Donald J. Cody & others (charts, tables, diagrams) (R) July 22	*38
Bugs eat their way through PCBs (N) Feb 4	21	Updated cost factors—CE Cost File. Ivan V. Klumpp & Steven T. Slavsky (graphs, tables) July 22	73	—Postscript Sept 2	5
Common fungus produces enzymes capable of degrading PCBs (C) July 8	18	Part 1: Process equipment Aug 19	76	—Letters Oct 28	5
EPRI reading new PCB-removal route for field tests (C) Apr 15	20	Part 2: Commodity materials Sept 16	85	A simple, automatic method to reduce scale buildup in sewer-pump systems. Adnan Y.M. Irfayem (P.N.) (diagram) Sept 16	100
GE study finds PCBs are being degraded naturally in the soil (C) May 13	15	Professional Development		Startup of centrifugal pumps in flashing or cryogenic liquid service. Inder S. Rattan	
A guide to EPA-approved PCB disposal methods. L. Kokoszka & J. Flood (tables) July 8	41	How to present a paper at a conference. V. Ganapathy (chart, table) Sept 30	87		
Westinghouse PCB cleanup will use its own novel incinerator (C) June 10	10	Use personal public relations to build your career. Donald M. Levin Sept 16	81		
Westinghouse settles with EPA on a \$75-100-million PCB cleanup (C) June 10	9				
Polyester—Soviet policies threaten cancellation of polyester fiber complex (C) Aug 5	12				
Polyethylene					
Allied enters the high-strength market with					

NOTES—*Illustrated; (C) Chemtator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

& Vijay K. Pathak (P.N.) (diagrams)					
Purchasing—Equipment selection: How to really assess costs. Harold W. Russell (table)	Aug 5	103	temp applications. Frank J. Tanzosh (N)	Feb 18	30
Purification			Chemical engineers are going online. Nicholas Basta (N)	Oct 28	16
Aquanautics' innovative membrane will be studied for blood purification (C)	May 13	14	Coal-liquefaction consortium started up by five U.S. universities (C)	Aug 5	9
Biotechnology: Fermentation and downstream processing—report. Ed Bjurstrom (charts, tables, diagrams) (R)	Feb 18	126	—Postscript	Sept 30	5
—Letter	June 24	5	Cooperative Research Center for Chemical Process Modeling and Control established by Lehigh Univ. (N)	Mar 18	39
Monsanto seeks to expand Prism separators into water removal (C)	May 13	14	Cornell U. researchers develop method of making recombinant protein at half the cost, or less, of current techniques (C)	Nov 11	19
Pyrolysis			DOE announces next round of small-business innovation grants (C)	Jan 21	17
Continuous method for pyrolyzing tires into gas, oil and carbon black (C)	Sept 16	11	DOE-funded study identifies most promising new methods for separations involving liquids or gases (C)	Sept 16	10
Heating value of coal can be upgraded by 10% in a pyrolysis process (C)	Sept 30	9	Dow expands Texas polymer research facilities (N)	July 22	19
			Enhanced oil recovery: Research brightens future of enhanced oil recovery. Gerald Parkinson (N) (diagrams, chart)	Mar 4	25
			Ethanol: Boom in fuel ethanol begets new capacity and research. Richard Zanetti & others (N) (table)	Jan 21	38
			—Letter	Mar 4	5
			—Postscript, corrections	Apr 15	5
			Evanson/University Research Park: Plans for research center in Midwest (N)	Mar 18	34
			Government scientists seeking new ways to fund basic research (C)	Dec 9	12
			MIT and Alfa-Laval to set up joint center to research biochemical separations (C)	Sept 16	10
			Michigan researchers' route to detoxify dioxin using clay (C)	Sept 2	19
			NSF sets up six Engineering Research Centers (C)	Apr 29	9
			New impetus for hi-tech research: six U.S. government centers. Rex Rhein (N)	Aug 5	19
			PPG Industries steps up biotech research: agreement with Scripps (N)	Feb 18	39
			Plasma: pace of U.S. research in plasma processing must pick up says NMAB report (C)	Mar 18	18
			Polymers: effects of aging on polymer blends will be researched (C)	Dec 9	11
			R&D outlays to rise: Battelle forecast (N)	Feb 18	41
			R&D tax credits: White House okays a three-year extension (C)	July 22	12
			Supercritical fluids: still seeking acceptance. Nicholas Basta & Silke McQueen (N)	Feb 4	14
			UCSF team redesigns enzyme, trypsin, to alter both its function and efficiency (C)	Apr 29	9
			U.N.-sponsored biotechnology center sets a schedule for staffing (C)	Mar 18	19
			Resins		
			Design for pilot system that will reduce the volume of resins used to adsorb radioactive material from nuclear-powerplant wastewater (C)	Oct 28	11
			Diamond Shamrock to pay a \$900,000 fine under TSCA for failing to notify EPA before it manufactured or imported three ion-exchange resins (C)	Aug 5	38
			Engineering resins aim at wider CPI markets. Cynthia Fabian Mascone (N)	Oct 14	27
			Retirement—Du Pont's early retirement plan's popularity surprises company (C)	Apr 29	10
			Reverse Osmosis		
			Dow buys FilmTec, maker of thin-film membranes (N)	July 22	23
			Reverse osmosis and ultrafiltration solve separation problems. Charles H. Gooding (diagrams, graphs, charts)	Jan 7	56
			Robotics		
			ICEF warns workers of killer robots (N)	Apr 29	20
			New impetus for hi-tech research: Six U.S. government-supported centers. Rex Rhein (N)	Aug 5	19
			Roofs & Roofing—Does the roof leak? Roger V. Morrison Part 1: Jan 21 *131, Part 2:	Feb 18	191
			Rubber		
			CE alert: New technology	Mar 4	80
			57th inventory	Aug 19	63
			58th inventory	Nov 25	51
			CE construction alert Apr 15-82	Nov 25	51
			United Rubber Workers settle with BF Goodrich on a labor contract (C)	May 13	14
			Russia		
			Chemical projects (2) may be cancelled (C)	Aug 5	12
			Coal-slurry pipeline will be built with Occidental Petroleum help (C)	Jan 7	19
			Sulfuric acid process could cut costs (C)	Nov 25	15
			S		
			Safety		
			AIChE plans "Center for Chemical Plant Safety" (C)	Apr 15	18
			Center for Chemical Plant Safety gets work underway. Paula Dwyer (N)	June 10	29
			New agenda for AIChE safety center (N)	Nov 25	22
			British Gas' plan to scale up CO-to-methane process at Scottish plant set back by explosion (C)	Apr 1	11
			BLS reports that the rates of job-related injuries in both the chemical and petroleum industries were less in 1984 (C)	Nov 25	16
			Calculator program for compressible flow in pipes. Ilona Györi (diagram, tables)	Oct 28	55
			California quake could hurt plants (N)	Oct 28	18
			California study confirms an increase in health problems in Santa Clara County (C)	Feb 4	10
			Chemical plant safety: the longer, deeper view (Ed)	Apr 1	5
			Congressional agenda has much to affect CPI. Paula Dwyer (N)	Apr 1	26
			Controlling fired heaters. Vincent G. Gomes (diagrams, tables, flow charts)	Jan 7	63
			Eliminating potential process hazards—report. Trevor A. Kletz (diagrams, tables, flowchart) (R)	Apr 1	48
			—Letters June 10-5	Dec 9	5
			EPA launches Emergency Preparedness Program (C)	Dec 9	12
			EPA report says more than 135 people have died and another 1,500 were injured in U.S. since 1980 in nearly 7,000 accidents involving toxic chemicals (C)	Oct 14	12
			Estimating relief loads for thermally blocked-in liquids. Ernesto C. Valdes & Kenneth J. Svoboda (charts, tables)	Sept 2	77
			—Correction	Sept 30	5
			"Guidelines for Hazard Evaluation Procedures," AIChE book sets forth measures for upping safety at U.S. chemical plants (C)	Nov 11	18
			Hazard identification, analysis and control. Henry Ozog (tables, graph, diagrams)	Feb 18	161
			Illinois court finds three executives guilty of murder in connection with a death at a now-defunct silver extraction company (C)	July 8	19
			ICEF warns workers of killer robots (N)	Apr 29	20
			Lockouts save lives. Darwin E. Rhoads	Sept 2	95
			MIC: new transport safety standards issued by DOT (C)	Oct 28	12
			NIOSH		
			Guidelines for large-scale r-DNA fermentations. Chandra Sekhar (table, flow-diagram)	Apr 29	57
			Respirator-selection procedure for chemicals (C)	Oct 28	9
			New wardrobe for CPI workers. Cynthia Fabian Mascone (N)	Aug 19	14

NOTES—*Illustrated; (C) Chemticator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

[illegible]

NOTES—*Illustrated: (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

Steam-system design: How it evolves—report. John F. Peterson & William L. Mann (charts, diagrams, tables) (C)	62	A more accurate equation for estimating horizontal-tank volumes. J.J.J. Chen (P.N.)	154	Ramachandran (diagrams, graphs)	63
Steam-trap capacities. Elmer S. Monroe (charts)	62	Petroform method of cleaning oil storage tanks uses "robot" spraying system (C)	18	—Postscripts, corrections	11
Steam traps: New trap designs trim steam losses. Richard Zanetti & Shota Ushio (N)	62	Underground tanks: regulation coming up. Paula Dwyer (N)	17	Thermal conductivity of some insulating materials as a function of temperature. Alejandro Anaya Durand (P.N.)	153
Steel		Tar Sands		Thermoplastics	
Select thermowell dimensions to avoid vibration resonance from gas flow. Thomas N. Stein (P.N.) (graphs, table)	84	New ways to recover hard-to-reach petroleum. Gerald Parkinson (N) (flow diagram)	31	Dual-polymer laminates for corrosion-resistant equipment. J. Albert Rolston (tables)	89
Selecting alloys for chloride service. Gary N. Kirby (charts & tables) Part I: Feb 4 '81, Part 2:	99	UN's third international conference on heavy crude and tar sands: Ways to recover heavy oil, bitumen, star at conference. Gerald Parkinson (N) (flow-scheme)	12	Sulfur concrete for acid resistance. Scott S. Pickard (tables)	77
Stockpiles—National Defense Stockpile: White House backs plan to reduce stockpile (C)	12	Taxes—RAD tax credits: White House okays a three-year extension (C)	12	Tires—Continuous method for pyrolyzing tires into gas, oil and carbon black (C)	1
Storage		Technology		Titanium—Ethylene/propylene copolymerization benefits from new titanium catalysts (C)	10
Bulk solids handling—report. Edwin V. Reece (charts, tables, diagrams)	38	CE alert: Technology	73	Titanium Dioxide	
—Letters July 22-5	5	57th inventory	59	Chemetics announces project for recovering spent sulfuric acid from TiO ₂ production by the sulfate route (C)	15
EPA proposes new standards for hazardous-waste storage tanks (C)	20	CE construction alert: Miscellaneous technology Apr 15-86	56	New feed, new technique enlarges the TiO ₂ scenario. Jeffrey Ryser & others (N)	18
Petroform method of cleaning oil storage tanks uses "robot" spraying system (C)	18	Telephone—Make the telephone work for you. Joseph W. Mocarski	91	Toxics	
Underground tanks: regulation coming up. Paula Dwyer (N)	17	Temperature		Bacteria that consume toxic chemicals will be cultured in polluted soil (C)	10
Styrene		Determine possible compressor icing conditions. Steven R. Johnson (P.N.) (graph)	89	Biotech develops first enzyme immunoassay kit for detecting aflatoxin (C)	9
Large offering isothermal, styrene-monomer process (C)	17	Does your plant instrumentation work properly? Donald L. May (charts, table, diagrams)	67	EPA's toxics policy attracts opposition. Maria Recio & Reginald Rhein (N)	29
New styrene process pares production costs: single-step isothermal process. Herbert C. Short & Lois Bolton (flow chart)	30	Improve kiln utilization through noncontact temperature measurement. David S. Bartran & Kirby Nelson (P.N.) (diagram)	65	EPA report says more than 135 people have died and another 1,500 injured in U.S. since 1980 in nearly 7,000 accidents involving toxic chemicals (C)	12
UOP catalyst could trim the cost of making styrene by 14/lb (C)	12	Industrial temperature sensing done with fiber optics	29	EPA takes solid action on risk assessment guidelines. Jeffrey Trehwitt (N)	47
Sugar—SPRI develops better acid test for polysaccharides in cereals (C)	11	Predict saturation temperature as a function of vapor pressure. Mangesh P. Wagle (tables)	13	International groups work out uniform rules for toxics. Joyce Heard & others (N)	21
Sulfates—Ferric sulfate is a better flocculant than aluminum sulfate (C)	9	Quickly calculate temperature cross in 1-2 parallel-counterflow heat exchangers. K.N. Murty (P.N.) (diagram, chart)	153	Labeling: Industry groups take the initiative on uniform rules for toxics labeling (C)	11
Sulfur		Temperature compensator for controlling the air/fuel ratio to boilers (C)	20	Toxic Substances Control Act	
Desulfurization—see Desulfurization		Thermal conductivity of some insulating materials as a function of temperature. Alejandro Anaya Durand (P.N.)	17	EPA assesses fines of \$6.9 million against six chemical firms (C)	20
Sodium/sulfur battery system will be developed cooperatively by Sandia and Chloride Silent Power Ltd. (C)	10	Weighted mean temperature-difference for exchangers with phase changes. Ben Tammani (P.N.) (charts & table)	230	UC fined \$3.9 million for alleged violations of rules involving diethyl sulfate tests (C)	20
Sulfur concrete for acid resistance. Scott S. Pickard (tables)	77	Tennessee Valley Authority—One-step phosphate-ore beneficiation process (C)	17	Diamond Shamrock to pay a \$900,000 fine for failing to notify EPA before it manufactured or imported three ion-exchange resins (C)	11
Sulfur Dioxide—DOE discovers high-capacity SO ₂ absorbent, pressure-hydrated lime (N)	38	Testing		Translating—Do-it-yourself technical Russian. Carlos Torres-Marchal (tables)	49
Sulfur Oxides		Biotechnology testing		Transmitters—Transmitters—Two-wire or four-wire? Frank J. Lawson (diagrams)	73
DOE seeking to scale up process for cleaning up both SO ₂ and NO _x (C)	10	Field testing of gene-spliced "ice minus" organisms still being held up (C)	20	Travel	
UOP, Inc. will scale up DOE process (C)	15	"Ice minus" bacteria: both sides disputing field tests of gene-spliced bacteria claim victory (C)	21	Are you ready for that overseas trip? (Thomas Garcia-Borras (table)	123
EPA's E-SO ₂ method points to less costly approach for SO ₂ removal from stack gases (C)	15	International groups want uniform rules for toxics. Joyce Heard & others (N)	117	—Letter	5
Sulfuric Acid		Particulate tests: Do you need a fourth particulate-sampling test? Gerald A. Rich (diagram, table)	12	How to organize a business trip. Kenneth J. McNaughton	95
Chemetics announces project for recovering spent acid from TiO ₂ production by the sulfate route (C)	15	SPRI develops better acid test for polysaccharides in cereals (C)	79	Tubes & Tubing	
Soviet sulfuric acid process could cut costs (C)	15	Using tests and service histories to select metals and alloys. William L. Silence & others (charts, tables)	90	Estimate surface area of finned tubes. V. Ganapathy (P.N.) (nomograph)	156
Sulphur 85—International conference: highlights (C)	15	Thermodynamics		Pfaudler unveiling silicon-carbide tubing for heat exchangers (C)	17
Superconductivity—First superconducting magnet for industrial applications commercialized by Erie Magnetics (C)	67	Calculate thermal conductivity for unassociated liquids. Clayton P. Kerr (P.N.)	85	Tungsten—Tungsten could replace aluminum in semiconductor manufacture (C)	17
Supervision—Shift workers: Managing the shift worker. Gary W. Vandiver	18	Estimate relative volatility quickly. M.P. Wagle (P.N.)	77	Turbines	
Sweden		Estimating relief loads for thermally blocked-in liquids. Ernesto C. Valdes & Kenneth J. Svoboda (charts, tables)	5	Auxiliary turbine is flexible and rugged	47
SKF Steel breaks ground on its first Plasma-chrome plant (C)	17	—Correction		Maximizing energy savings for heat engines in process plants. Eric Hindmarsh & others (tables, diagrams, flow sheets, graphs)	38
Swedways scaling back business in barge-mounted chemical plants (C)	17	Quick design and evaluation of heat regenerators. Milorad P. Dudukovic & P.A.		Protect turbomachinery from magnetism. Ashok K. Mittal (P.N.) (diagrams)	24
Synthesis—Expert systems gear up for process synthesis jobs. Jay Chowdhury (N) (diagram)	17				
T					
Tanks					
EPA proposes new standards for hazardous-waste storage tanks (C)	20				

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

U

Ultrasonics—Putting chemical reactions on a sound footing. Gordon M. Graff (N) (diagram).....	Mar 18	*22
—Letters Apr 29-5.....	Aug 5	5
—Correction.....	Sept 30	5
United Nations		
Third international conference on heavy crude and tar sands: Ways to recover heavy oil, bitumen, star at conference. Gerald Parkinson (N) (flowscheme).....	Sept 16	*17
U.N.-sponsored biotechnology center sets a schedule for staffing (C).....	Mar 18	19
U.S. Advanced Ceramics Assn.—First board meeting will be held next month (C).....	Sept 16	12
U.S. Dept. of Energy—Herrington, John will be new chief, replacing Hodel (C).....	Jan 21	20
U.S. Dept. of the Interior—Hodel, Donald will be new chief, replacing William Clark (C).....	Jan 21	20
Uranium		
CANMET and McGill Univ. developing process to co-extract radium and uranium from ore (C).....	Sept 2	19
Solvent-extraction U ₂ enrichment can compete with gaseous diffusion (C).....	Sept 16	11

V

Vacuum—Fast metal plating, with vacuum arcs: technology under development at Israel's Tel Aviv Univ. (C).....	Mar 4	19
Valves		
Butterfly valves feature manufactured-in-leaktightness.....	May 27	*47
CPI flutter over flawed valves. Jay Chowdhury & Herb Short (N).....	Sept 2	*22
—Letters.....	Nov 11	5
Flare system design by microcomputer. Tom Chung Tsai (table, diagram).....	Aug 19	55
—Letter.....	Oct 28	5
Plastic-lined ball valve features positive shutoff and excellent corrosion resistance.....	July 22	*31
Prevent plug valves from sticking and jamming. Adnan Irbayem (P.N.) (diagrams).....	Apr 29	88
Preventing cavitation in butterfly valves. Hans D. Baumann (graphs, diagrams).....	Mar 18	149
Selecting pressure relief valves. Gary B. Emerson (diagrams).....	Mar 18	195
Sizing relief valves for fire emergencies. R.A. Crozier, Jr. (graphs, tables).....	Oct 28	49
Specifying rotary valves. Edward D. Pittman (diagrams).....	July 8	89
What are fire-safe valves? John M. Cory & Frederick D. Riccioli (table).....	May 27	147
Vapor Deposition—Modular, production-scale equipment for gallium arsenide wafers offered by Emcore (C).....	Aug 5	11
Vapor Pressure		
Determine the vapor pressure of HCl at low concentrations and temperatures. J. Neil Stone (P.N.) (table).....	Sept 16	102
Predict saturation temperature as a function of vapor pressure. Mangesh P. Wagle (tables).....	June 10	*77
Venezuela—Ways to recover heavy oil, bitumen, star at UN conference: VCC process; HDH process. Gerald Parkinson (N) (flowscheme).....	Sept 16	*17
Ventilation—Ventilating CPI buildings. John D. Constance (chart, tables, diagrams).....	Dec 9	89
Vibration—Select thermowell dimensions to avoid vibration resonance from gas flow. Thomas N. Stein (P.N.) (graphs, table).....	July 22	84
Viscosity—Predicting flowrates from positive displacement rotary pumps. Michael L. Dillon & others (graphs, flow diagram).....	July 22	*57

W

Waste Disposal		
Hazardous wastes		
Bankruptcy limits the financial obligations of hazardous-waste-dump owners rules Supreme Court (C).....	Jan 21	20
California's McColl wastesite controversy: "Don't leave hazardous wastes here, but don't move them either!" (C).....	May 27	19
California court stops a waste-dump cleanup—because it's too hazardous (C).....	July 8	19
Chemical Waste Management's Emelle, Ala. disposal facility: EPA settles (C).....	Jan 7	20
Chemical Waste Management pays top-dollar penalties for violations at Vickery, O. facility (N).....	May 13	31
Clean Sites Inc.: Private group in cleanup efforts (N).....	May 27	33
Critical-fluid extraction removes organics from hazardous wastes (diagram).....	June 24	*27
EPA issues final water rule for pesticide makers (N).....	Oct 14	25
EPA lambasted again over management of hazardous wastes (C).....	May 13	16
EPA moves to change hazardous-waste insurance requirements (C).....	Sept 2	20
Hazardous-waste-dumps have caused few serious health effects says study (C).....	Apr 1	10
OTA reports it may take \$100 billion to clean up uncontrolled waste dumpsites (C).....	Mar 18	20
"Spill arrestor" for emergency chemical fixation of liquid hazardous chemicals (C).....	Mar 4	18
Storage tanks: EPA proposes new standards for hazardous-waste storage tanks (C).....	July 8	20
Time has run out for land disposal facilities. Rex Rhein & Jeff Trewhitt (N).....	Dec 9	30
Underground tanks: regulation coming up. Paula Dwyer (N).....	Apr 29	*17
U.S. government will have to supply wastesite liability insurance (C).....	Sept 16	12
What are your views on hazardous wastes?—report (survey, including questionnaire) Nicholas Basta, Roy V. Hughson & Cynthia F. Mascone.....	Mar 4	*58
Engineers' opinion: Hazardous wastes are not under "acceptable" control in the CPI (C).....	Sept 2	17
Chemical engineers speak out on... Hazardous-waste management—report. Nicholas Basta, Roy V. Hughson & Cynthia F. Mascone (charts, tables).....	Sept 16	*58
Italy will ban nonbiodegradable plastic bags and containers by 1991 (C).....	Feb 4	11
Nuclear: "Retrievable" radioactive-waste disposal sites (3) picked by DOE (C).....	May 13	15
PCBs		
Common fungus produces enzymes capable of degrading PCBs (C).....	July 8	18
A guide to EPA-approved PCB disposal methods. L. Kokoszka & J. Flood (tables).....	July 8	41
Westinghouse settles with EPA on a \$75-100-million PCB cleanup (C).....	June 10	9
Westinghouse PCB cleanup will use its own novel incinerator (C).....	June 10	10
Resource Conservation and Recovery Act		
see Law		
Superfund		
EPA's mobile incinerator will conduct a trial burn of dioxin-bearing wastes in southern Missouri (C).....	Jan 21	18
Superfund hearings leave the means of funding the program unresolved (C).....	Apr 15	20
Superfund legislation passes out of the		

Senate Finance Committee (C).....	May 27	20
Porter, J. Winston sworn in as EPA's Superfund programs chief (C).....	Aug 19	12
Cleanups being slowed as money runs low (C).....	Sept 2	20
Senate approves amendments to the Superfund reauthorization bill (C).....	Sept 30	12
House committees continue working on the Superfund reauthorization bill (C).....	Oct 14	12
House sets a Nov. 14 deadline for completing work on Superfund (C).....	Nov 11	20
Waste Disposal see also Incineration		
Waste Management—What are your views on hazardous wastes?—for detailed listings see Waste Disposal		
Waste Treatment		
Bacteria that consume toxic chemicals will be cultured in polluted soil (C).....	Oct 14	10
Biotech method will be used to decontaminate a major toxic waste site in Blackburn, U.K. (C).....	Nov 25	16
Great Lakes: EPA makes plan for Great Lakes cleanup (N).....	Nov 11	37
Hazardous wastes		
Critical-fluid extraction removes organics from hazardous wastes (diagram).....	June 24	*27
ICI scaling up enzyme process for treating cyanide-bearing wastes (C).....	Apr 15	18
"Spill arrestor" for emergency chemical fixation of liquid hazardous chemicals (C).....	Mar 4	18
What are your views on hazardous wastes?—for detailed listings see Waste Disposal		
Incineration see Incineration		
Los Alamos scientists discover peptide produced naturally by the monkey flower and jimson weed could be used to recover toxic metals (C).....	July 22	10
Microbial process for removing PCB from soil (C).....	Sept 30	11
Shell Oil and the U.S. Army must clean up the vast Rocky Mountain Arsenal (C).....	Dec 9	10
VerTech waste treatment process is keyed to mile-long reactor. Gerald Rappe (diagram, flowscheme).....	Apr 15	44
Waste Utilization		
Continuous method for pyrolyzing tires into gas, oil and carbon black (C).....	Sept 16	11
Converting crushed fruit pulp to biogas with Cornell's anaerobic fermenter (C).....	Oct 14	11
Dorr-Oliver-Flakt process to convert dry-FGD wastes into usable products (C).....	Apr 1	10
EPA controlling the burning of hazardous wastes for fuel under the RCRA (C).....	Nov 25	16
Landfill-gas/cogeneration system being built for SmithKline Beckman (C).....	Mar 18	17
Landfill gas used in fuel-cell test (N).....	Mar 18	40
Membranes will be investigated in a process to recover organic solvents from waste gas streams (C).....	Aug 5	11
Metals recovery makes big splash in Canada: two conferences, CIM Metallurgical Soc. and 6th International Symposium on Biohydrometallurgy. Gerald Parkinson (diagram) (N).....	Sept 30	*19
Northeast Industrial Waste Exchange announces database for wastes (C).....	May 27	17
Recycling		
EPA proposed regulation of an estimated 800 waste-oil recyclers (C).....	Jan 21	20
Waste-oil recycling process unveiled by Krupp (C).....	June 24	9
Waste-plastic recycling unit: Didier gets contract for plant in Pakistan (C).....	June 24	10
U.S. BOM pilots a process to recover cobalt from coppermine byproduct streams; Los		

NOTES—*Illustrated; (C) Chemticator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

Alamos looks at cobalt recovery from coal wastes (C)..... Feb 4

Water

Membranes for hydrolyzing water will be tested in a joint effort (C)..... Sept 2
SRI process obtains methane via electro-chemistry using carbonated water (C)..... July 6

Water Pollution

CE alert: New technology..... Mar 4
57th inventory..... Mar 4
Clean Water Act: House reauthorizes Clean Water Act (C)..... Aug 5
EPA issues final water rule for pesticide makers (N)..... Oct 14
EPA report is optimistic about water quality (N)..... Sept 16
Great Lakes: EPA makes plan for Great Lakes cleanup (N)..... Nov 11
Groundwater: Detecting pollution in groundwater with electromagnetic system (N)..... Aug 5

Water Treatment

Design for pilot system that will reduce the volume of resins used to adsorb radioactive material from nuclear-powerplant wastewater (C)..... Oct 28
EPRI-sponsored project in North Carolina field tests for removing mineral pollutants from coal ash (C)..... Jan 7
"Formed in place" metal membrane from Carre Inc. can be used for large variety of wastewaters (C)..... Feb 18
The lingering lure of gold spurs processing developments. Gerald Parkinson & others. (N) (flowsheet/schematic)..... June 10
Nalco offering all-organic oil/water-separation chemicals (C)..... Apr 15
Novel technique for the removal of heavy metals from water (C)..... Dec 9
Reverse osmosis and ultrafiltration solve separation problems. Charles H. Gooding (diagrams, graphs, charts)..... Jan 7
Treatment of wastewater by batches saves money..... Jan 21
Unique technique for removing heavy metals from industrial wastewaters (C)..... Apr 1
Use boiler feedwater for hot-water heating. Dale R. Symsek (P.N.) (flow chart)..... Aug 19
Wastewater treatment—report. W. Wesley Eckenfelder Jr. & others (tables, flow charts, graphs, diagrams) (R)..... Sept 2
Wax—Japan: Harima's process uses algae to make unsaturated wax from tall fatty acid (C)..... Sept 30
Women—AIChE discusses women's issues (N)..... Sept 30
Wood—Katzen to design 25-to-30 ton/d plant for alcohol wood-pulping process (C)..... Sept 30
Writing—Follow these rules to write good instructions. Richard A. Kujawski..... Apr 15

Y

Yeast

Canada's Alberta Research Council announces r-DNA results using yeasts (C)..... May 27
Phillips Petroleum announces new gene-splicing mechanism for yeasts (C)..... May 27

Z

Zeolites

Georgia Institute of Technology sets up academic program to study zeolites and molecular sieves (N)..... May 27
Zeolite catalyst for fluidized-catalytic cracking from Katalitiks (C)..... June 10

AUTHOR INDEX

Arnold, Victor E..... Feb 4
Axtell, Roger E..... May 27
Baas, Case J. & Steven P. Sawin..... May 27
Unipol PP: A gas-phase route to polypropylene..... May 27
Bancel, Paul L..... Nov 11
Cogeneration fuels—the high cost of lower heating values..... Nov 11
Barsamian, J. Ara..... Feb 18
Distributed computer systems for the plant..... Feb 18
Bartran, Davis S. & Kirby Nelson..... June 24
Improve kiln utilization through noncontact temperature measurement..... June 24
Basta, Nicholas..... Oct 28
Chemical engineers are going online..... Oct 28
Computer hardware finding niches in CPI engineering-design work..... Apr 29
Computerized maintenance management offers dividends for CPI firms..... June 10
For sale? Slightly used phenylalanine plant..... Nov 25
It's rollercoaster time for Ch.E. supply/demand..... Sept 16
Making profitability a process-control variable..... Nov 11
Slagging combustor burns coal efficiently..... Sept 30
Union Carbide engineers speak out..... Dec 9
Basta, Nicholas & Silke McQueen..... Feb 4
Supercritical fluids: still seeking acceptance..... Feb 4
Basta, Nicholas & Wilma Price..... May 27
AAES narrows its scope, gives up unifying role..... May 27
Cogeneration keeps soaring in the CPI..... Aug 5
Basta, Nicholas & others..... Mar 18
U.S. CPI start to feel effects of Bhopal tragedy..... Mar 18
What are your views on hazardous wastes?..... Mar 4
Chemical engineers speak out on..... Mar 4
Hazardous-waste management..... Sept 16
Baumann, Hans D..... Mar 18
Preventing cavitation in butterfly valves..... Mar 18
Beazley, William G..... Oct 28
Transferring CAD flowsheets Part 1: Oct 28
*61, Part 2: Dec 9
Bell, Norbert J..... Oct 14
Shortcut methods for determining optimum line sizing in SI units..... Oct 14
Bjurstrom, Ed..... Feb 18
Biotechnology: Fermentation and downstream processing..... Feb 18
Bloch, Heinz P. & Donald A. Johnson..... Nov 25
Downtime prompts upgrading of centrifugal pumps..... Nov 25
Boland, David & others..... Feb 4
Maximizing energy savings for heat engines in process plants..... Feb 4
Bolton, Lois & Herbert C. Short..... Aug 19
New styrene process pares production costs..... Aug 19
Bowen, Richard L. Jr..... Mar 18
Agitation intensity: Key to scaling up flow-sensitive liquid systems..... Mar 18
Bowie, George E..... May 27
Specifying and operating desuperheaters..... May 27
Bradford, Hazel..... Sept 2
Synfuel plans: Are they going up in smoke?..... Sept 2
Brandsema, Willem..... Oct 14
Constructing with corrosion-resistant lead..... Oct 14
Broyles, Robert K..... Oct 14
Pipe loop or expansion joint?..... Oct 14
Buse, Frederic W..... Dec 9
Power consumption of mechanical double-seals..... Dec 9
Cauterford, J.H..... Oct 28
Hydrometallurgy: Winning metals with water..... Oct 28

Cappabianca, Carl J. & Paul F. Pelosi..... June 24
Corrosion control in steam and condensate lines..... June 24
Chen, J.J.J..... May 27
A more accurate equation for estimating horizontal-tank volumes..... May 27
Predict gas/liquid-flow pressure drop..... July 22
Chirillo, Richard D. & John F. Kenefick..... Feb 18
Photogrammetry and computer-aided piping design..... Feb 18
Chowdhury, Jay..... Aug 19
Expert systems gear up for process synthesis jobs..... Aug 19
New catalysts hold keys to new chemical reactions..... Oct 28
Chowdhury, Jay & Herb Short..... Sept 2
CPI flutter over flawed valves..... Sept 2
Chowdhury, Jay & others..... Dec 9
Bhopal, a year later: Learning from a tragedy..... Dec 9
Motionless mixers stir up sluggish markets..... May 13
Process controllers don "expert" guises..... June 24
Cody, Donald J. & others..... July 22
Selecting positive-displacement pumps..... July 22
Cohen, Ernest..... Sept 16
Process automation—CE Refresher 13. Fault-tolerant processes..... Sept 16
Cohen, Ernest M. & Willi Fehervari..... Apr 29
Process automation—CE Refresher 12. Sequential control..... Apr 29
Conlon, John C. & others..... May 27
Regression equations forced through a coordinate point..... May 27
Constance, John D..... Dec 9
Ventilating CPI buildings..... Dec 9
Constantinescu, Serban..... Dec 9
Designing the optimum trough..... Dec 9
Sizing gas pressure-relief nozzles..... Apr 29
Cooper, P.G..... Mar 4
SI units simplify calculations..... Mar 4
Cordova, G.J. & others..... Jan 21
Microprocessor-based distributed control systems..... Jan 21
Cory, John M. & Frederick D. Riccioli..... May 27
What are fire-safe valves?..... May 27
Crozier, R.A. Jr..... Oct 28
Sizing relief valves for fire emergencies..... Oct 28
Demorest, William J. Jr..... Sept 30
Pressure measurement..... Sept 30
Dillon, Michael L. & others..... July 22
Predicting flowrates from positive-displacement rotary pumps..... July 22
Doyle, G.T. & others..... Jan 21
Microprocessor-based distributed control systems..... Jan 21
Dudukovic, Milorad P. & P.A. Ramachandran..... June 10
Quick design and evaluation of heat regenerators..... June 10
Durand, Alejandro Anaya..... May 27
Thermal conductivity of some insulating materials as a function of temperature..... May 27
Dwyer, Paula..... June 10
AIChE safety center gets work underway..... June 10
Coming up: regulation of underground tanks..... Apr 29
Congressional agenda has much to affect CPI..... Apr 1
Dwyer, Paula & Jeff Trehwitt..... May 13
Waste-law amendments are taxing EPA's resources..... May 13
Eckenfelder, W. Wesley Jr. & others..... Sept 2
Wastewater treatment..... Sept 2
Egan, Kevin M. & James D. King..... May 27
Modify your batch reactor's material-transfer system to avoid problems..... May 27
Emerson, Gary B..... Mar 18
Selecting pressure relief valves..... Mar 18
Farrell, Pia & others..... Apr 15
Chemical engineering schools: What they're doing to adapt..... Apr 15
Faust, Charles A..... July 8
Operating boilers intermittently..... July 8
Fehervari, Willi & Ernest M. Cohen..... Apr 29
Process automation—CE Refresher 12. Sequential control..... Apr 29

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

Flood, J. & L. Kokoszka A guide to EPA-approved PCB disposal methods July 8	41	Kerr, Clayton P. Calculate thermal conductivity for unassociated liquids Feb 4	90	Mann, William L. & John F. Peterson Steam-system design: How it evolves Oct 14	*62
Ganapathy, V. Estimate boiler-blowoff steam flow July 22	83	King, James D. & Kevin M. Egan Modify your batch reactor's material-transfer system to avoid problems May 27	153	Marris, Barbara How good are your reading skills? Feb 18	*185
Estimate surface area of finned tubes May 27	156	Kipin, Peter Cleaning pipelines: A pigging primer Feb 4	*53	Martin, Eugenie L. & Harriet A. Katz The golden rules of business politics Dec 9	105
How to present a paper at a conference Sept 30	87	Kirby, Gary N. Selecting alloys for chloride service Part 1: Feb 4 *81, Part 2: Mar 4	*99	Mascone, Cynthia Fabian Engineering resins aim at wider CPI markets Oct 14	*27
Garcia-Borras, Thomas Are you ready for that overseas trip? Jan 21	*123	Kister, Henry Z. Complex binary distillation Jan 21	*97	New wardrobe for CPI workers Aug 19	*14
China and the chemical engineer July 22	*65	Complex multicomponent distillation May 13	*71	Sizing up particle analyzers Nov 11	*30
Gilbert, R.D. What do you know about participative management? Apr 1	79	Kletz, Trevor A. Eliminating potential process hazards Apr 1	48	Mascone, Cynthia F. & others What are your views on hazardous wastes? Mar 4	*58
Goldfarb, Stewart M. Design calculations Apr 15	91	Kline, Philip H. & others Predicting flowrates from positive-displacement rotary pumps July 22	*57	Chemical engineers speak out on hazardous-waste management Sept 16	*58
Gomes, Vincent G. Controlling fired heaters Jan 7	*63	Klotz, William L. Estimate equilibrium for exponential change Mar 4	108	Massiah, Thomas F. How to store and retrieve technical articles Aug 19	71
Gooding, Charles H. Reverse osmosis and ultrafiltration solve separation problems Jan 7	*56	Klumpar, Ivan V. & Steven T. Slavsky Updated cost factors Part 1: Process equipment July 22	73	Matley, Jay CE cost indexes set slower pace Apr 29	75
Gourlia, Jean-Paul & Victor Kaiser The ideal-column concept: Applying exergy to distillation Aug 19	45	Part 2: Commodity materials Aug 19	85	May, Donald L. Does your plant instrumentation work properly? Mar 4	67
Graff, Gordon M. Putting chemical reaction on a sound footing Mar 18	*22	Part 3: Installation labor Sept 16	93	McAlister, James Avoid erratic control operation by suppressing relay arcs Oct 14	105
Gunkler, Albert A. Putting computers in control Nov 11	*177	Knight, Brian & Vaughan Voller Expert systems June 10	93	When job dissatisfaction strikes Apr 29	69
Györi, Ilona Calculator program for compressible flow in pipes Oct 28	55	Kohn, Philip M. & others Canadian CPI seeks to rebound from recession Jan 21	*41	McGee, Noel F. Process automation—CE Refresher 11. Microprocessor controllers Feb 4	67
Hardison, L.C. Treating hydrogen sulfide: An alternative to Claus Jan 21	62	Kokoszka, L. & J. Flood A guide to EPA-approved PCB disposal methods July 8	41	McNaughton, Kenneth J. Are chemical engineers losing financial ground? Apr 15	99
Haydon, Martin & Fredericka Mackenzie How to unclutter your organization June 10	*99	Kolts, Juri & others Using tests and service histories to select metals and alloys Apr 29	79	How to organize a business trip Oct 14	*95
Heard, Joyce & others International groups want uniform rules for toxics July 22	21	Kujawski, Richard A. Follow these rules to write good instructions Apr 15	107	McQueen, Silke & Nicholas Basta Supercritical fluids: still seeking acceptance Feb 4	*14
Hertanu, H.I. & others Microprocessor-based distributed control systems Jan 21	*86	Larrabee, Graydon B. A challenge to chemical engineers—microelectronics June 10	*51	Mendel, Otto Estimating engineering cost Dec 9	117
Hile, Lloyd R. Absorber/stripper design with a programmable calculator Apr 29	53	Lashway, Robert W. Sintered alpha-silicon carbide: An advanced material for CPI applications Dec 9	121	Miller, Robert E. Statistics—CE Tutorial 4. Means and variances Jan 21	107
Hindmarsh, Eric & others Maximizing energy savings for heat engines in process plants Feb 4	*38	Lass, Herbert & Jenness Keene New instrumentation will use antibodies Apr 29	*19	5. Analysis of variance Mar 18	173
Hirschel, Robert Solving differential equations by the relaxation method Apr 15	93	Lawson, Frank J. Transmitters: Two-wire or four-wire? Apr 1	73	6. Time-series analysis June 10	85
Hughson, Roy V. & others What are your views on hazardous wastes? Mar 4	*58	Lee, T.S. Preventing galvanic corrosion in marine environments Apr 1	89	7. Correlation and regression Sept 30	71
Chemical engineers speak out on hazardous-waste management Sept 16	*58	LeVarge, Paul J. & Paul B. Thornton Effective coaching and counseling Mar 18	191	Mital, Ashok K. Protect turbomachinery from magnetism June 24	66
Irhayem, Adnan Y.M. Prevent plug valves from sticking and jamming Apr 29	88	Levin, Donald M. Use personal public relations to build your career Sept 16	81	Mocarski, Joseph W. Make the telephone work for you Sept 2	91
A simple, automatic method to reduce scale buildup in sewer-pump systems Sept 16	100	Levinson, William Automatic solution of single-variable equations Nov 25	43	Monroe, Elmer S. Steam-trap capacities Apr 15	*73
Johnson, Donald A. & Heinz P. Bloch Down-time prompts upgrading of centrifugal pumps Nov 25	35	Lindamood, Dan M. Determine the most economical thickness for hot-pipe insulation Apr 1	96	Monroe, Robert C. Minimizing fan energy costs Part 1: May 27-141, Part 2: June 24	57
Johnson, John E. & D. John Morgan Graphical techniques for process engineering July 8	72	Lipowicz, Mark A. Fluid-flow and flow-network software Nov 25	59	Moore, John A. Retrofitting control systems Nov 11	*172
Johnson, Steven R. Determine possible compressor icing conditions Feb 4	89	Personal-computer-software reviews Sept 2	*85	Morgan, D. John & John E. Johnson Graphical techniques for process engineering July 8	72
Jonas, Leonard A. & others Regression equations forced through a coordinate point May 27	129	Liskey, A. Keith Pultruded fiberglass-reinforced plastic (FRP): A structural solution for corrosive environments Nov 11	*221	Morrison, Roger V. Does the roof leak? Part 1: Jan 21 *131, Part 2: Feb 18	*191
Kaiser, Victor & Jean-Paul Gourlia The ideal-column concept: Applying exergy to distillation Aug 19	45	Lowenstein, Jack G. The pilot plant Dec 9	*62	Morrison, Steve Selecting a personal computer Sept 30	79
Katz, Harriet A. & Eugenie L. Martin The golden rules of business politics Dec 9	105	Lunde, Kenneth E. Joint-product costing Part 2: Application Jan 7	95	Mullins, Mark & Darrell O'Kelly Programming control algorithms Mar 18	183
Keene, Jenness & Herbert Lass New instrumentation will use antibodies Apr 29	*19	Transfer pricing Feb 4	*85	Murty, K.N. Quickly calculate temperature cross in 1-2 parallel-counterflow heat exchangers Sept 16	99
Kenefick, John F. & Richard D. Chirillo Photogrammetry and computer-aided piping design Feb 18	173	Lyford-Pike, Roy J. Plan your time with the critical path method May 13	*103	Nelson, Kirby & David S. Bartran Improve kiln utilization through noncontact temperature measurement June 24	65
		Mackenzie, Fredericka & Martin Haydon How to unclutter your organization June 10	*99	O'Kelly, Darrell & Mark Mullins Programming control algorithms Mar 18	183
				Olujic, Zarko Predicting two-phase-flow friction loss in horizontal pipes June 24	45
				Ozog, Henry Hazard identification, analysis and control Feb 18	161
				Parkinson, Gerald Big step ahead for fuel cells July 22	*15
				Metals recovery makes big splash in Canada Sept 20	*19
				New pump models aim at satisfying CPI needs Apr 1	*14

NOTES—*Illustrated; (C) Chemticator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

New ways to recover hard-to-reach petroleum Apr 15	31	Rhein, Rex	Updated cost factors	73
Research brightens future of enhanced oil recovery Mar 4	25	A new biotech concern: exports to hostile nations Sept 2	Part 1: Process equipment July 22	73
Ways to recover heavy oil, bitumen, star at conference Sept 16	*17	New impetus for hi-tech research Aug 5	Part 2: Commodity materials Aug 19	76
Parkinson, Gerald & others		Washington decides on biotechnology regulation Feb 18	Part 3: Installation labor Sept 16	85
The lingering lure of gold spurs processing developments June 10		Washington sets up new group to oversee biotech work Nov 11	Snowdon, Sondra	
Pathak, Vijay K. & Inder S. Rattan	*19	Rhein, Rex & Maria Recio	International business protocol Nov 25	65
Forestalling construction problems Nov 25		EPA's air toxics policy arouses opposition July 8	Spratt, Don & others	
Startup of centrifugal pumps in flashing or cryogenic liquid service Apr 1	69	Rhein, Rex & Jeff Trehwitt	Selecting positive-displacement pumps July 22	*38
Patoczka, Jerzy & others	95	Time has run out for land disposal facilities Dec 9	Springmann, Helmut	
Wastewater treatment Sept 2	60	Rhoads, Darwin E.	Cryogenics: Principles and applications May 13	*58
Peacock, Edwin M. Jr.	199	Lockouts save lives Sept 2	Stein, Thomas N.	
Heaterless dryers are not heatless Nov 11		Riance, X.P.	Select thermowell dimensions to avoid vibration resonance from gas flow July 22	83
Pelosi, Paul F. & Carl J. Cappabianca	61	More learning—the hard way May 13-109	Stone, J. Neil	
Corrosion control in steam and condensate lines June 24		Part 2 June 10	Determine the vapor pressure of HCl at low concentrations and temperatures Sept 16	102
Peters, Richard A.	95	Riccioli, Frederick D. & John M. Cory	Sutton, Ian	
Integrated computer-aided engineering May 13		What are fire-safe valves? May 27	Converting software for microcomputers Jan 21	*115
Peterson, John F. & William L. Mann	*62	Rich, Gerald A.	Svoboda, Kenneth J. & Ernesto C. Valdes	
Steam-system design: How it evolves Oct 14		Do you need a fourth particulate-sampling test? Aug 5	Estimating relief loads for thermally blocked in liquids Sept 2	77
Pickard, Scott S.	77	Richardson, Leon D.	Sylvester, Nicholas D. & Denis J. Zigang	
Sulfur concrete for acid resistance July 22		Motivation—Management's greatest opportunity Nov 11	Equations for orifice-meter sizing Feb 4	91
Pittman, Edward D.	89	Rogers, James A.	Turbulent-flow friction-factor equations Apr 29	86
Specifying rotary valves July 8		Process automation—CE Refresher	Symsek, Dale R.	
Pogany, George A.	132	14: Optimizing process and economic aims Dec 9	Use boiler feedwater for hot-water heating Aug 19	83
How to overcome resistance to new ideas Jan 7		Rolston, J. Albert	Tammami, Ben	
Polonyi, Michael	*83	Dual-polymer laminates for corrosion-resistant equipment Jan 7	Weighted mean-temperature-difference for exchangers with phase changes Nov 11	230
Operating performance of reciprocating or positive-displacement compressors Dec 9		Russell, David L.	Tanzosh, Frank J.	
Powell, Terence E.	187	Managing your environmental audit June 24	New ceramic units seek high-temp applications Feb 18	*30
A review of recent developments in project evaluation Nov 11		Russell, Harold W.	Thornton, Paul P. & Paul J. LeVarge	
Price, Wilma & Nicholas Basta	*27	Equipment selection: How to really assess costs Aug 5	Effective coaching and counseling Mar 18	191
AAES narrows its scope, gives up unifying role May 27		Ryser, Jeffrey & others	Torres-Marchal, Carlos	
Cogeneration keeps soaring in the CPI Aug 5	14	New feed, new technique enliven the TiO ₂ scenario Nov 25	Do-it-yourself technical Russian Feb 4	49
Price, Wilma & Herb Short	22	St. Clair, Kenneth A. & others	Townsend, D. William & others	
Hard task: Choosing a route for making polypropylene July 8		Predicting flowrates from positive-displacement rotary pumps July 22	Maximizing energy savings for heat engines in process plants Feb 4	*38
Price, Wilma & others	*17	Sansone, Eric B. & others	Trehwitt, Jeffrey	
How library spending stacks up Feb 4		Regression equations forced through a coordinate point May 27	EPA takes solid action on risk-assessment guidelines Jan 21	*47
U.S., European refiners ready for low-lead limits Oct 14	18	Sawin, Steven P. & Case J. Baas	Patent protection stars at biotech conference June 24	*17
Prieto, Raul F.	229	Unipol PP: A gas-phase route to polypropylene May 27	U.S. Midwest makes pitch for biotech-research firms Apr 15	*27
Shortcut methods for estimating solids inventory Nov 11		Schweber, William L.	Trehwitt, Jeffrey & Paula Dwyer	
Pryor, Fred	*107	Microcomputer process control Aug 5	Waste-law amendments are taxing EPA's resources May 13	*23
How to get things done July 8		Sekhar, Chandra	Trehwitt, Jeff & Rex Rhein	
Purohit, G.P.	85	Guidelines for large-scale r-DNA fermentations Apr 29	Time has run out for land disposal facilities Dec 9	30
Costs of double-pipe and multitube heat exchangers Part 1: Mar 4-93, Part 2: Apr 1		Shah, Navin D.	Tsai, Tom Chungshu	
Raghavachari, S.	98	Tips for success in consulting June 24	Flare system design by microcomputer Aug 19	55
Extend the life of slurry agitators Apr 1		Sheppard, Walter L., Jr.	Twigg, Ronald J.	
Ramachandran, P.A. & Milorad P. Dudukovic	63	Expansion joints for chemically resistant masonry Aug 19	Preventing corrosion during mothballing Sept 16	*91
Quick design and evaluation of heat regenerators June 10		Short, Herb	Ushio, Shota & Richard Zanetti	
Rao, K.V. Kasipati	83	A facelift for Achema 85 May 13	New trap designs trim steam losses Sept 30	*14
Orifice-meter design for steam flow Aug 19		Future fertilizer plants: What will they be like? Apr 1	Valdes, Ernesto C. & Kenneth J. Svoboda	
Rappe, Gerald	44	Short, Herbert C. & Nicholas Basta	Estimating relief loads for thermally blocked-in liquids Sept 2	77
Waste treatment process is keyed to milestone reactor Apr 15		Making profitability a process-control variable Nov 11	Vandell, Craig A. & others	
Rattan, Inder S. & Vijay K. Pathak	69	Short, Herb & Lois Bolton	Selecting positive-displacement pumps July 22	*38
Forestalling construction problems Nov 25		New styrene process pares production costs Aug 19	Vandiver, Gary W.	
Startup of centrifugal pumps in flashing or cryogenic liquid service Apr 1	95	Short, Herb & Jay Chowdhury	Managing the shift workers Oct 28	67
Recio, Maria & Reginald Rhein	*29	CPI fluter over flawed valves Sept 2	Venturino, Anthony P.	
EPA's air toxics policy arouses opposition July 8		Short, Herb & Wilma Price	How to promote your invention to a patent committee Aug 5	*113
Reece, Edwin V.	38	Hard task: Choosing a route for making polypropylene July 8	Veranth, John M.	
Bulk solids handling Apr 29		Short, Herb & Robert Skole	Project scheduling techniques Apr 15	61
Reeves, Gary G.	*119	Membrane-cell developments ease electrochemistry scaleup Mar 4	Voller, Vaughan & Brian Knight	
Use pressure gage to measure flow Oct 14		Short, Herb & others	Expert systems June 10	93
Remirez, Raul	27	Fierce competition is on among LLDPE licensors Feb 18	von Brecht, Richard C.	
CPI capital spending plans remain generous in 1985 June 10		U.S., European refiners ready for low-lead limits Oct 14	Prefabricated control modules May 13	*85
Remirez, Raul & others	18	Silence, William L. & others	Wagle, Mangesh P.	
U.S., European refiners ready for low-lead limits Oct 14		Using tests and service histories to select metals and alloys Apr 29	Estimate relative volatility quickly Apr 29	85
		Slavsky, Steven T. & Ivan V. Klumpar	Predict saturation temperature as a function of vapor pressure June 10	*77

NOTES—*Illustrated; (C) Cimentator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

Walas, S.M.		Part 16: Predict surface tensions of pure liquids	Feb 4	63	Zanetti, Richard & Shota Ushio		
Chemical reactor data	Oct 14	79	Part 17: Predict surface tensions of binary liquid mixtures	Oct 14	87	New trap designs trim steam losses	Sept 30 *14
Estimate the eutectic conditions of binary mixtures	Aug 19	86	Weiss, W.H.			Zanetti, Richard & others	
Wansbrough, Robert W.		95	What style of management do you prefer?	Feb 4	*77	Boom in fuel ethanol begets new capacity and research	Jan 21 *38
Modeling chemical reactors	Aug 5		West, James			Boosting tower performance by more than a trickle	May 27 *22
Warner, Jerry D.			Disc-bowl centrifuges	Jan 7	*69	Structured is the byword in tower-packing world	Mar 4 *22
Timing a cooling tower Part 1: Sept 30 *95, Part 2: Oct 28	*71		Wilensky, Jerome			Zigrang, Denis J. & Nicholas D. Sylvester	
Watkin, Andrew T. & others			Are you a victim of hidden stress?	Mar 4	*87	Equations for orifice-meter sizing	Feb 4 91
Wastewater treatment	Sept 2	60	Wright, Victor E.			Turbulent-flow friction-factor equations	Apr 29 86
Weber, James H.			Microcomputer CAD systems	July 8	*99		
Programs for predicting properties with the TI-59 calculator			Wu, James B.C. & others				
			Using tests and service histories to select metals and alloys	Apr 29	79		

NOTES—*Illustrated; (C) Chementator; (N) Newsfront; (P.N.) Plant Notebook; (R) Reprints available

THE CHEMICAL ENGINEERING GUIDE TO CORROSION

This first volume of THE ENGINEERING GUIDE TO CORROSION provides guidelines to help cope with a variety of corrosion and materials-selection problems. It contains articles that appeared in CHEMICAL ENGINEERING during the past five years. The book covers theory and applications in a variety of areas that will help you to make the proper materials selection and to solve many problems you may face. The book is divided into eight sections:

- Section I — Basics on corrosion prevention, monitoring and water treating.
- Section II — Materials selection and identification.
- Section III — Paints and coatings.
- Section IV — Materials to resist specific chemicals, processes and wear.
- Section V — Metals and alloys.
- Section VI — Fiberglass-reinforced plastics and other polymers.
- Section VII — Refractories, insulation and ceramics.
- Section VIII — Other materials.

Send me _____ copies of THE CHEMICAL ENGINEERING GUIDE TO CORROSION \$42.50.

Enclosed is my check (or money order) made out to *Chemical Engineering*. It includes my local sales tax plus 10% for postage and handling. Send my book(s) to the address shown on the coupon. (Orders must be prepaid. Outside the U.S. payment must be in U.S. dollars drawn against a U.S. bank.)

Amount of order\$
Plus 10% postage
and handling\$
Local sales tax\$
Total\$

Please place this order in an envelope with your remittance and mail to:
Stephanie Finn, Special Projects
CHEMICAL ENGINEERING, 43rd Fl.
1221 Avenue of the Americas
New York, NY 10020

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Country _____

Practical Process Instrumentation and Control, Volume II

This second volume of PRACTICAL PROCESS INSTRUMENTATION & CONTROL is of immediate concern to the engineer directly involved in the design and operation of manufacturing processes.

In five sections, this sequel thoroughly covers:

- Control System Design and Operation
- Dynamic Modeling of Process Systems
- Process Control Instrumentation & Techniques
- Flow Measurement and Control
- Temperature, Pressure and Level
- Analytical Instruments

Written and edited by a group of engineers thoroughly familiar with the subject, this book will prove most beneficial to those seeking to advance their knowledge of current and future control systems.

Send me _____ copies of PRACTICAL PROCESS INSTRUMENTATION & CONTROL, VOLUME II at \$42.50.

Enclosed is my check (or money order) made out to *Chemical Engineering*. It includes my local sales tax plus 10% for postage and handling. Send my book(s) to the address shown on the coupon. (Orders must be prepaid. Outside the U.S. payment must be in U.S. dollars drawn against a U.S. bank.)

Amount of order\$
Plus 10% postage
and handling\$
Local sales tax\$
Total\$

Please place this order in an envelope with your remittance and mail to:
Stephanie Finn, Special Projects
CHEMICAL ENGINEERING, 43rd Fl.
1221 Avenue of the Americas
New York, NY 10020

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Country _____